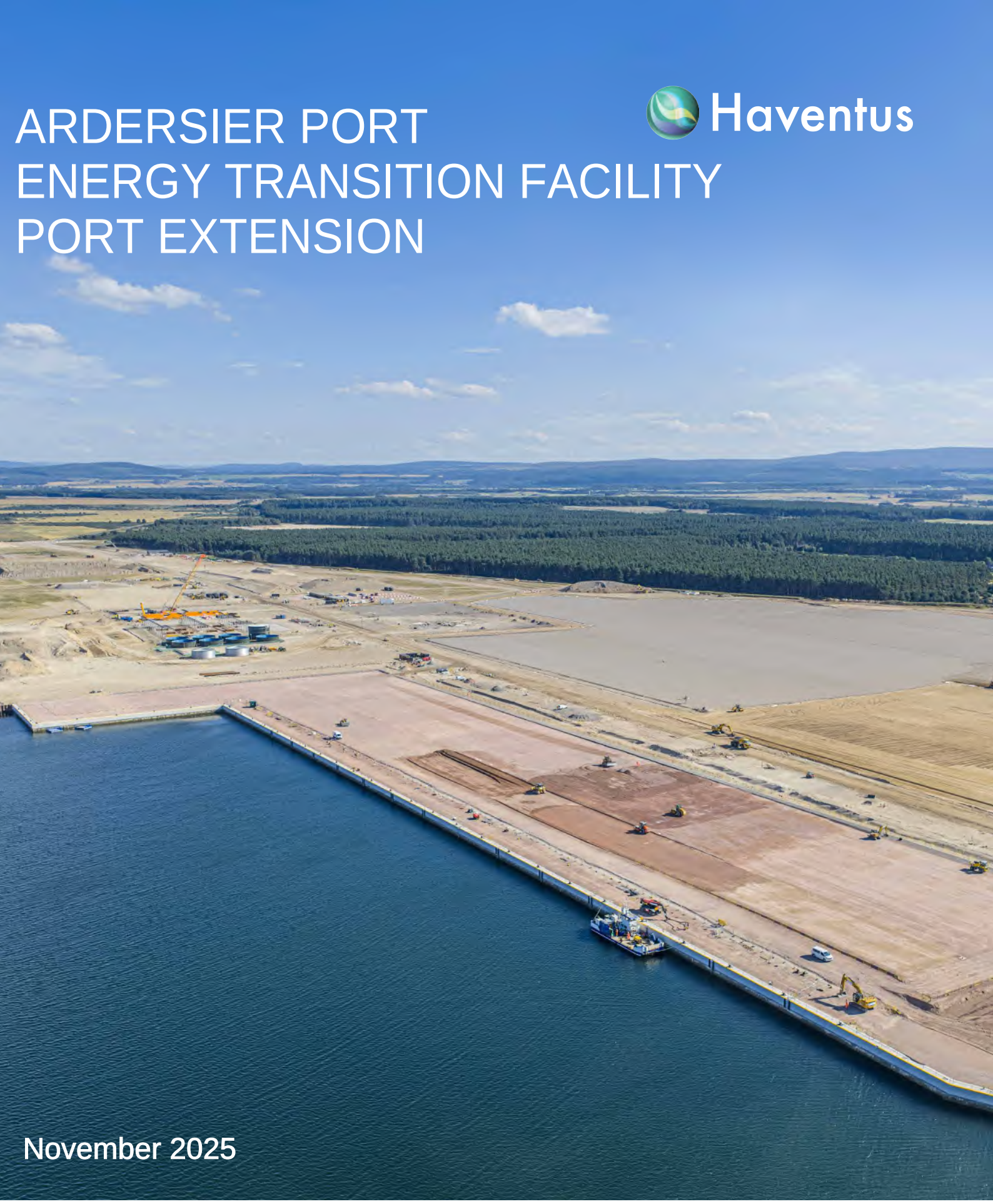
ARDERSIER PORT ENERGY TRANSITION FACILITY PORT EXTENSION

Haventus



November 2025

Appendix 3.1 Whiteness Head Stability Assessment

Haventus Group

Ardersier Port

Whiteness Head Stability Assessment

APP2-FHT-SP-XX-RP-C-000001

September 2025

FAIRHURST

CONTROL SHEET

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1.0 Introduction

Haventus Group are currently undertaking significant redevelopment works including construction of a new heavy lift quayside and associated dredging pocket to facilitate operations principally targeted at the offshore renewables sector. The navigation channel within the port is sheltered by Whiteness Head which is comprised principally from wind blown sands, and forms a natural breakwater from the outer Moray Firth, providing a high degree of protection from prevailing environmental actions.

The current proposals for Ardersier Port involve further extension of the previously widened and deepened navigation channel and berthing pocket created within Phase 1, into Phase 2 of the quayside works, thereby creating additional berths with a dredge level of -12.4mCD (+500mm overdredge allowance) and hence enabling vessels with a draft of up to 12.0metres to access the site.

This report has been compiled to summarise the initial assessment of the proposed dredging works and vessel operations within the site, utilising existing ground investigation information to create site-specific ground model to facilitate a stability assessment of the dredge pocket and proposed side slopes to Whiteness Head. These slopes have been compared against existing side slopes formed within Phase 1, to provide an onsite comparison, acknowledging there is considered to be a relatively low risk of significant variation in ground conditions within the Phase 2 area of the spit. The dredge slope profiles have been developed with particular consideration of the long-term stability of Whiteness Head.

The head of the spit is considered to present a lower risk to the overall stability of the spit due to the ongoing long-shore sediment transport from the East of the site, currently resulting in ongoing material deposition. It should be noted, this does present a challenge to maintain navigation from the Outer Moray Firth into the site, due to the significant deepening of the bathymetric from the end of the spit towards the port navigation channel. This is likely to result in material deposition as the short, steep waves are broken, resulting in transient material being deposited at this location, by this acting as a sediment sink. The impact of this deposition may result in localised instability to the head of the spit, which will require monitoring through a regular inspection, management and reinstatement (where necessary) regime.

In addition to the natural spit deposits, additional reinstatement works have been undertaken under the direction of Haventus Group, by DEME Offshore utilising material arising from the Phase 1 dredging works. This reinstatement extends over approximately 1100metres on the landward side of the spit, over both Phase 1 & Phase 2, and comprises the deposition of 120,000m^3 of material. It is understood these works have been undertaken in line with NewWaves Solutions (DEME Group) Document No: 6240-NWS-EXE-MST-0001 (Rev 01), Dated: 11th February 2025. It should be noted that as part of these works, no construction issue drawings showing the preparation, staging or benching of the deposited material have been provided, however a coordinated survey showing the finalised levels has been provided.

The impact of scour from the operation of vessels within the port has not been assessed within this report, however this remains an important aspect of the long-term stability of the dredged slopes on the lee-ward side of the spit. It should be noted that owing to the fine grain, tightly graded granular nature of the material forming the spit, these are highly susceptible to mobilisation under vessel thruster action, resulting in localised areas of scour unless protection measures are implemented. The degree to which scour may occur, will relate principally to the diameter/area and degree of power applied on the vessel thrusters (hence the velocity of water ejected from the thruster), as well as the linear distance and angle through which dispersion of the thruster force may be spread within the channel. This risk will require active management through regular bathymetric surveys and where necessary, localised reinstatement, to avoid development of larger-scale slope failures.

2.0 Basis of Design Assessment

2.1 Background

The findings of the design assessment presented within this report are based upon information available at the time of writing, when assessing the spit stability over the extent of the Phase 2 boundary. The proposed Marine Ground Investigation works extending over the Phase 2 footprint have not been undertaken to date, however boreholes undertaken on the spit, as part of previous phases of ground investigation, have been used in developing the ground model utilised within this assessment. This report is referenced below:

Solmek Ltd:

Ardersier Port (Scotland) Ltd, Ardersier Port, Inverness – Factual Site Investigation Report, Issue 4, Dated: March 2024, Status: Final;

Following completion of the proposed investigation works within Phase 2, encompassing works on the spit, the conclusions of this assessment will be reviewed in the context of the associated borehole logs and laboratory testing results.

This report presents the findings of the geotechnical stability assessment of the spit, in line with the proposed dredging works as part of the Phase 2 redevelopment, which encompassed the proposed dredge level of -12.4mCD (+500mm overdredge allowance).

This assessment has been undertaken to reflect the varied impacts of prevailing tidal level, throughout the tidal range noted below, as detailed within UK Hydrographic Office NP201B, Volume 1B, 2025:

- HAT: +4.80mCD (+2.70mOD)
- MHWS: +4.20mCD (+2.65mOD)
- MHWN: +3.30mCD (+1.20mOD)
- MSL: +2.50mCD (+0.40mOD)
- OD: +2.10mCD (+0.00mOD)
- MLWN: +1.70mCD (-0.40mOD)
- MLWS: +0.90mCD (-1.20mOD)
- LAT: +0.20mCD (-1.90mCD)

In addition, this assessment has been undertaken in accordance with the following recognised standards and guidance associated with dredging, land reclamation and vessel induced scour;

- BS6349 1-1 2013 - Code of practice for Planning and design of Operations;
- BS6349 1-3 2021 - Code of practice for Geotechnical Design;
- BS6349 5 2016 - Code of practice for Dredging & Land Reclamation;
- Eurocode 7 - Geotechnical Design - Part 1, General Rules *(and National Annex)*;
- PIANC WG180 (2015) - Guidelines for protecting berthing structures from scour caused by ships;

2.2 Dredge Profile

The dredge profile within this analysis has been developed to provide an initial base, at which it is anticipated the spit will remain stable, with cognisance of the following documentation:

- Existing ground investigation undertaken on the spit *(as here-in referenced)*. This highlights the existing superficial deposits are almost entirely sands, albeit with coarser granular material within the shallower deposits, with occasional pockets of silts at depth;
- Bathymetric and topographic data from the spit. From the available data within the footprint of Phase 2, the current profile is located at a broadly comparable (1:6) gradient;
- Guidance detailed within BS6349-1-3:2012 with reference to the range of dredge pocket slopes;
- Previous Phase 1 stability assessment undertaken by Arup;
- In addition to the above documentation, it is understood anecdotally that dredging works undertaken within Phase 1 have typically resulted in the dredge slopes forming a repose at around 1:6;

In line with the above previous findings, for the purposes of this initial assessment the dredge slopes through the natural sands have been considered at a slope of 1:6.

With consideration of the spit reinstatement method statement: NewWaves Solutions (DEME Group) Document No: 6240-NWS-EXE-MST-0001 (Rev 01), Dated: 11th February 2025, it is considered that owing to this material being newly placed with compaction induced through self-surcharging, the reinstated sands will perform as 'loose sands'. As no investigation has been undertaken through the reinstatement since completion, conservative estimates as to the likely insitu and laboratory properties of the material, have been adopted. Furthermore, whilst it is known the spit reinstatement materials were from dredge arisings within Phase 1, their precise location and level have not been clarified, therefore the PSDs from prior site investigation targets in the vicinity of their origin have not been reviewed.

Furthermore, the reinstatement works present a number of risks which can be mitigated and quantified to an extent by further site investigation, however may remain as inherent risks until the dredging works within Phase 2 are completed:

- In lieu of construction or as-built drawings of the spit reinstatement works, it is envisaged that in order to prevent planar failure(s) of the dredge slopes, preparatory works would have entailed benching of the existing natural sands prior to placement of the reinstatement material. In preparing this report, there has been no constructional evidence provided to clarify where these works have been undertaken. As such, there remains an outstanding risk of dredge slope failure as it cannot be determined if the material has been placed upon a flat or inclined slope. Placement upon an inclined slope would significantly increase the likelihood of planar failures as the spit material would not appropriately interlock with the reinstated material;
- Similarly, there is an inherent risk that owing to variations in the moisture content, from that of its origin location, which may occur through the dredging and placement process, there is an inherent risk that under self-surcharge and settlement, the reinstatement material may fail by piping as the moisture content is pushed to the surface of the slope. Evidently this action is highly subjective to the permeability of the sands, however the shallower deposits of sands are most vulnerable to this form of failure as a result of their lesser magnitude of self-surcharge;

- In addition, there is also a further risk that shallow piping failure of the dredge slope may occur due to the lack of practicable methods by which to compact the material when placed. As a result, there is potential by which cohesion of the sands (particularly with a higher silt content) may result in the arching of deposited material, which may subsequently be disturbed by variation in tidal levels, passing vessels or prevailing waves within the channel;

As a result of the risks associated with these potential mechanisms of failure within the spit reinstatement material, for the purposes of initial assessment, a considerably shallower dredge slope graded at 1:8 has been analysed. It is recognised this slope is particularly conservative, however this is modelled in lieu of any ground investigation reporting and with cognisance of the previously outlined risks.

3.0 Ground Conditions

The following subsections to this report detail the scope of spit investigation works in conjunction with a summary of the ground model developed, and upon which this initial stability assessment is based.

3.1 Ground Investigation Works

An intrusive ground investigation was undertaken by Solmek within the Phase 1 area of the spit between May and July 2023. These works were undertaken to determine the ground conditions, by undertaking insitu and laboratory testing to enable derivation of material properties of the stratification, and hence enable initial assessment of the spit footprint within Phase 2.

The scope of the investigation works comprised 5No. boreholes drilled up to 40m below ground level, with associated sampling, insitu and laboratory testing. This report is referenced below:

Solmek Ltd:

Ardersier Port (Scotland) Ltd, Ardersier Port, Inverness – Factual Site Investigation Report, Issue 4, Dated: March 2024, Status: Final;

Following review of the previously reported ground conditions, it is considered the stratification throughout the extent of the spit is relatively consistent. As a result of this, for initial assessment purposes, the stratification layering reported within borehole BH-SP05 has been utilised. In lieu of the surveyed level of the borehole at the time of drilling, it has been inferred the ground level on the spit was approximately MHWS (+4.20mCD).

It is understood that owing to statutory protections which apply to Whiteness Head, investigation works can only be undertaken at or below the level of MHWS. As a result, the properties of material above this level have been considered to be of comparable nature to that encountered immediately below the surface at MHWS.

3.2 Ground Model

Whiteness Head is a shingle spit formed by ongoing westerly longshore sediment transport, resulting in the surface of the spit being comprised from resultant coastal erosion deposits.

From the available site investigation data, the uppermost stratification is comprised from Dense Sandy Gravel overlying fine sands of Holocene age. Within these sands, the strata is typically described as medium-dense, varying locally from silty to gravelly Medium-Dense Sand, becoming finer with depth. The solid geology located below the site has not been confirmed during the previous phases of ground investigation however this is understood to be located at significant depth on the site, and therefore does not provide any meaningful influence upon the stability of the spit.

In summary of the preceding ground investigation works, the ground conditions and stratification detailed within Table 3.1, have been utilised within this initial assessment:

Stratification Description	Stratification Level		Unit Weight (kN/m^3)	Friction Angle (°)	Cohesion (kPa)	Youngs' Modulus ($kN/m^2/m$)
	From (mCD)	To (mCD)				
Dense Sandy Gravel	+6.400	+1.500	20	36	0	40,000
Medium-Dense Sand (Silty)	+1.500	-0.800	20	34	0	30,000
Medium-Dense Sand (Gravelly)	-0.800	-7.800	20	34	1	30,000
Medium-Dense Sand	-7.800	-10.800	20	35	0	35,000
Dense Sand	-10.800	-30.300	20	35	0	35,000
Fine-Medium Grain Sand (Reinstatement)	*N / A*	*N / A*	17	28	0	15,000

Table 3.1: Summary of material properties derived/assumed for stratification on site

In deriving the above material properties, the Standard Penetration Tests (SPT n) values obtained from the tests within the respective stratification were reviewed and correlated throughout the extent of the ground investigation works. Subsequent to their review, correction of the SPT results was undertaken in order to reflect the overburden pressures and rod length under testing, utilising the methods detailed within BS EN ISO 22476-3:2005 + A1:2011. Following this, a characteristic friction angle for the respective layers was derived based upon Mayne (2011).

The laboratory testing data from the shear box and triaxial (consolidated-drained) tests were shown to be in line with those derived from insitu testing therefore allowing derivation of the friction angle. Throughout the insitu and laboratory testing data, it can be demonstrated the uppermost layers containing a higher gravel content, have an elevated friction angle when compared to the increasingly fine grain sands at depth. It should be noted that as a result of the particularly narrow grading of the sands, the interlocking of particles is particularly poor hence the friction angles considered within this analysis.

With consideration of the spit reinstatement method statement from DEME Group, it is noted these materials are likely to perform in a less favourable manner than that of the sands encountered within the ground investigation of the spit. As a result of this, it is envisaged the reinstatement material is likely to perform comparable to 'Loose Sands' and hence a reduced friction angle and Youngs' Modulus has been considered for this material. Similarly, as the placed density of the material is unknown in lieu of ground investigation information from the material now insitu, this has been conservatively considered as $17kN/m^3$. These assumptions on the reinstatement material also recognise that their precise location and level have not been clarified, therefore the PSDs from prior site investigation targets in the vicinity of their origin could not be reviewed. On receipt of the Phase 2 ground investigation report from the spit, these parameters will be reviewed in the context of insitu findings.

4.0 Slope Stability Assessment

4.1 Modelling Inputs

The geometry utilised within initial assessment has been taken from bathymetric and topographical data provided by Haventus Group surveyed prior to, and shortly after the reinstatement works. In line with this survey data, this assessment utilises the geometry surveyed at both Chainage 700 & 1100 from model: 'ACAD-NAV-CHAN-Model', provided by Haventus Group. This chainage has been selected for this assessment, owing to these reflecting the largest cross section of material utilised within the reinstatement (Chainage 700) and that envisaged to be the general profile throughout Phase 2 (Chainage 1100), hence are considered likely to be reflective of the long-term spit stability.

In undertaking this assessment, a gradient of 1:6 has been considered throughout the depth of natural sands, whilst a gradient of 1:8 has been considered through the depth of the reinstatement material, encountered at Chainage 700. It is recognised that under operation and prevailing environmental conditions, this material is likely to form a continuous gradient from the toe level (-12.9mCD incorporating overdredge allowance) of the dredge slope, up to the head of the reinstatement works, with the slope ravelling back to an alignment struck between the dredged toe and existing crest alignments, from that analysed. In light of the slope angle, this process is considered unlikely to result in destabilisation of the existing spit.

In addition, analysis has been undertaken in order to demonstrate the impacts of both Lowest and Highest Astronomical Tide upon the proposed dredge slopes. For the purposes of this initial assessment, allowance for scour from vessel thrusters has not been considered; the impacts of this upon the dredge side slopes will be reviewed once the Phase 2 ground investigation works on the spit have been completed.

4.2 Modelling Method

This analysis has been undertaken utilising Plaxis 2D finite element analysis software, to verify the proposed dredge slope stability and review the slip failure mechanisms which may impact the spit. The Plaxis model was initialised as a flat profile, with the dredge profiles of the existing spit reviewed at the respective LAT & HAT levels, before a comparable analysis incorporating the reinstatement works, utilising both EC7 SLS & EC7 DA1 C2. EC7 DA1 C1 was not considered relevant as no surcharge loading has been considered upon the spit.

A plane strain model type has been utilised with boundary conditions defined to simulate insitu behaviour of the materials as far as possible. Mesh discretisation has been undertaken utilising the medium coarseness option, however this has been adjusted to finer grading within the finalised slope.

The factors of safety calculated within the various scenarios were computed utilising the strength reduction (phi/c reduction) method in which the material strength is continually reduced until failure occurs.

The following scenarios have been considered within this analysis; these are shown graphically within Figures 4.1-4.6:

Condition 1: Pre-existing profile at Chainage 700 (without reinstatement works) with LAT tidal level;

Condition 2: Pre-existing profile at Chainage 700 (without reinstatement works) with HAT tidal level;

Condition 3: Current profile at Chainage 700, with consideration of reinstatement works at LAT tidal level;

Condition 4: Current profile at Chainage 700, with consideration of reinstatement works at HAT tidal level;

Condition 5: Current profile at Chainage 1100 with LAT tidal level;

Condition 6: Current profile at Chainage 1100 with HAT tidal level;

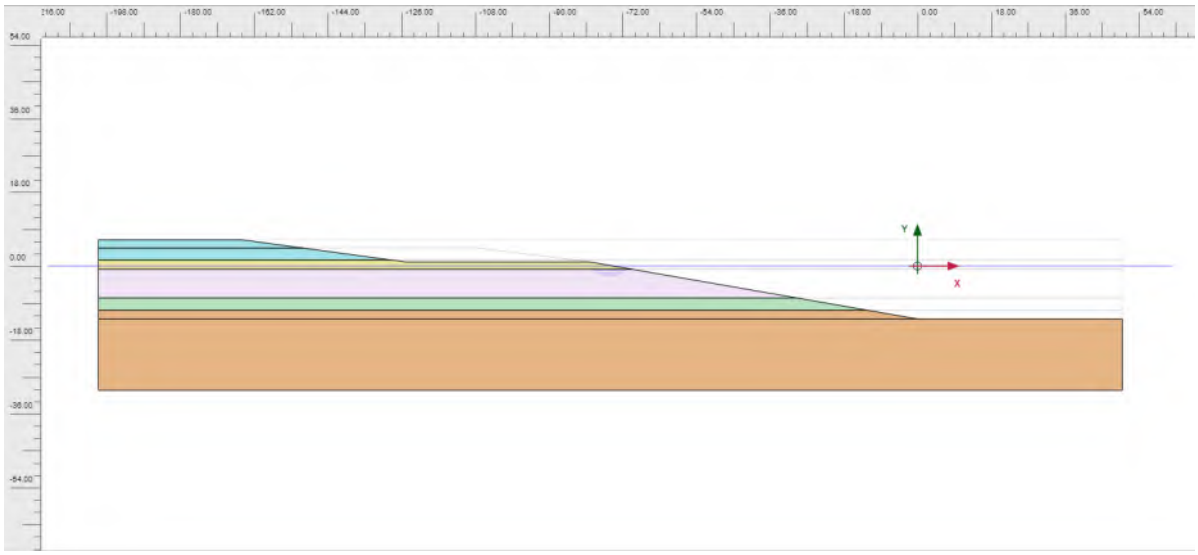


Figure 4.1: Pre-existing profile at Chainage 700 with LAT tidal level (Condition 1)

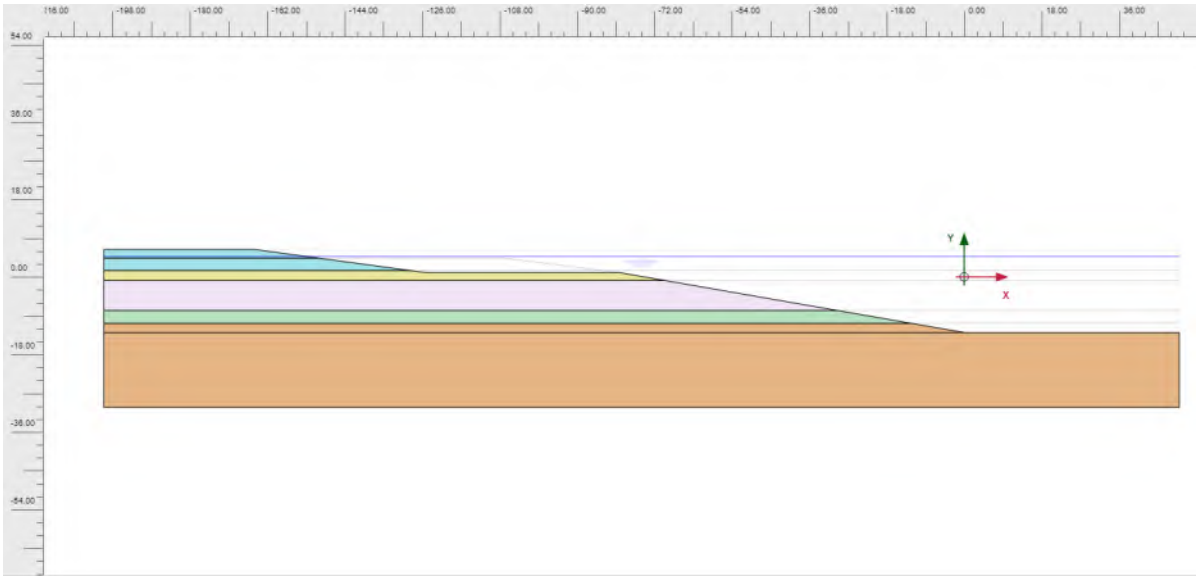


Figure 4.2: Pre-existing profile at Chainage 700 with HAT tidal level (Condition 2)

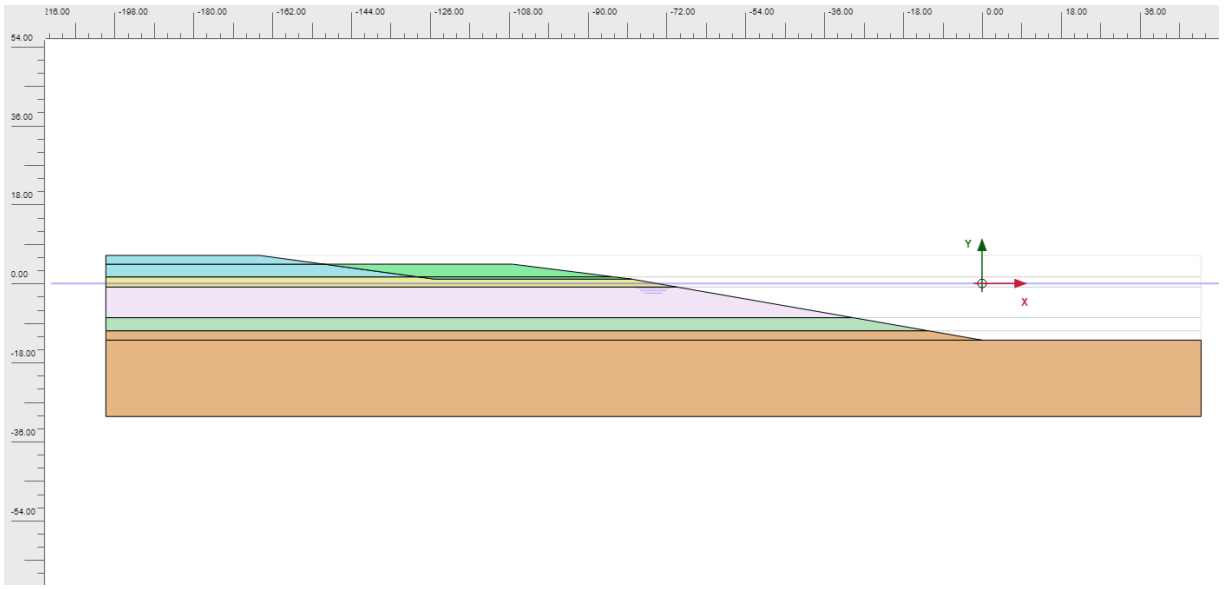


Figure 4.3: Current profile at Chainage 700, with consideration of reinstatement works at LAT tidal level (Condition 3)

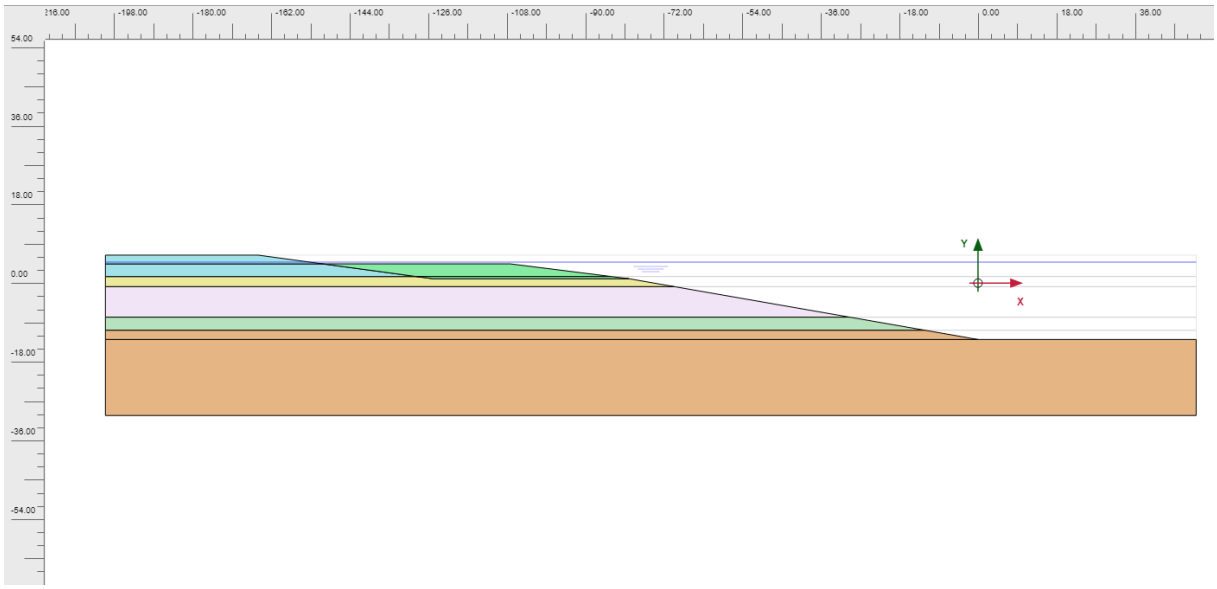


Figure 4.4: Current profile at Chainage 700, with consideration of reinstatement works at HAT tidal level (Condition 4)

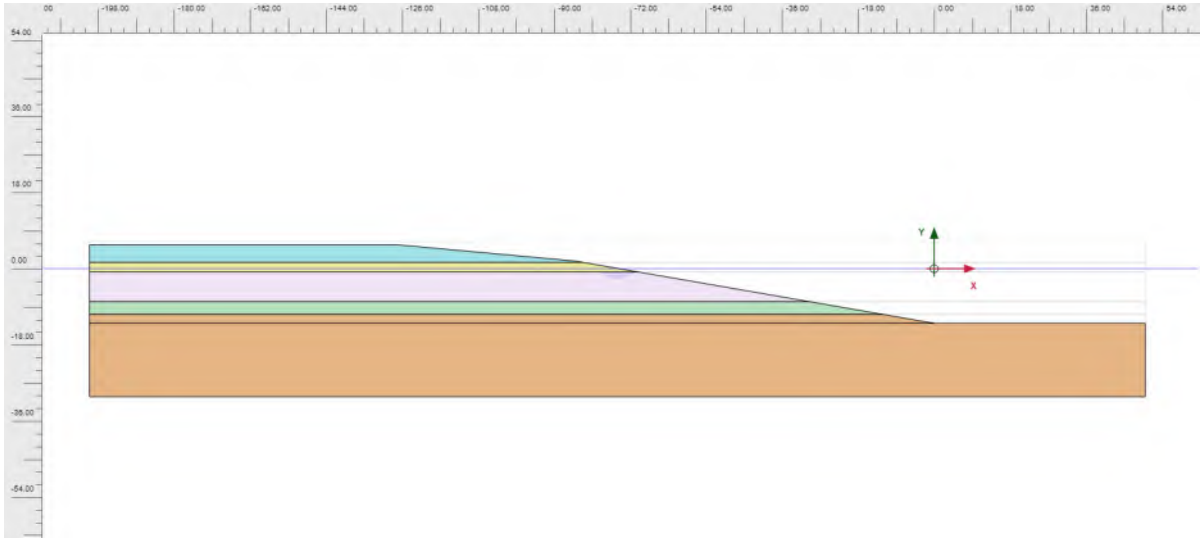


Figure 4.5: Current profile at Chainage 1100 with LAT tidal level (Condition 5)

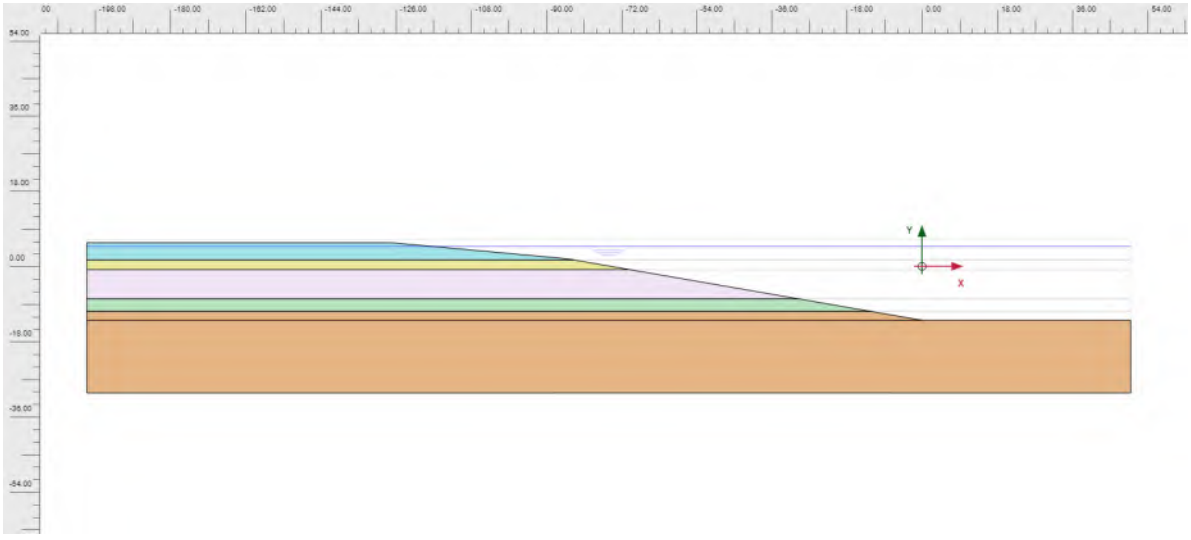


Figure 4.6: Current profile at Chainage 1100 with LAT tidal level (Condition 6)

4.3 Assessment Findings

In line with the existing ground investigation information as well as both bathymetric and topographic surveys of the spit, as well as the assumptions here-in stated in relation to the reinstatement works, Table 4.1 details presents the analysed factors of safety (FoS) / over-design factor (ODF) in the context of both EC7 SLS and EC7 DA1 C2.

Condition	EC7 SLS (FoS / ODF)	EC7 DA1 C2 (FoS / ODF)
1	3.237	2.590
2	4.103	2.587
3	3.235	3.247
4	4.069	3.132
5	3.253	2.599
6	3.956	3.173

Table 4.1: Summary of Plaxis 2D, SLS & DA1 C2 results from Chainage 700 & 1100

The factor of safety calculated within Condition 1 was of a lesser magnitude than calculated in Condition 2, due to the LAT level being located in very close proximity to the crest of the lower dredge side slope, based upon the pre-existing profile. Within Condition 1 the failure mechanism was observed to propagate from within the Medium-Dense Sand (Silty) as shown within Figure 4.5 & 4.5a. With consideration of the phi/c reduction method, factoring down the tangent of the friction angle, utilising the FoS within this condition equates to a friction angle of 11.8°.

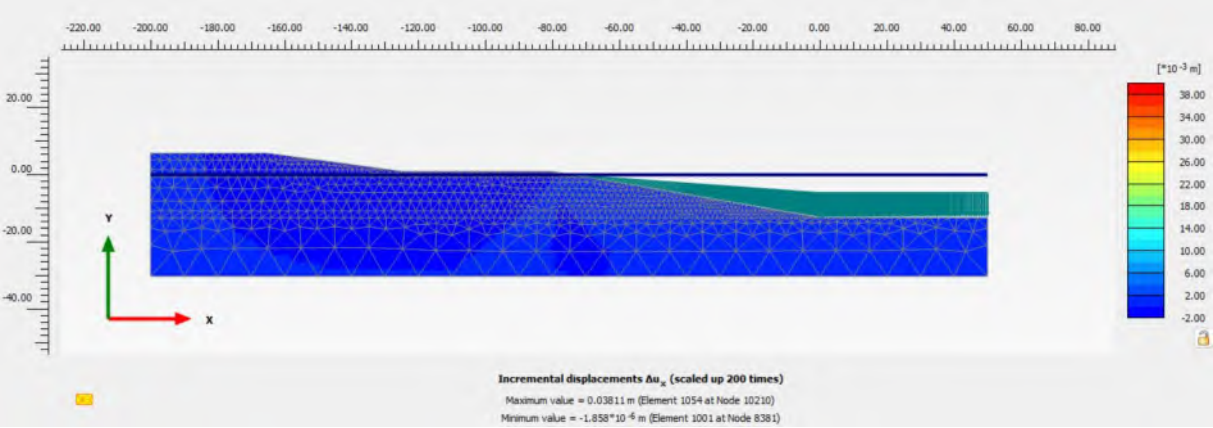


Figure 4.5: EC7 SLS FoS Incremental Displacement Plot (x-direction) – Condition 1

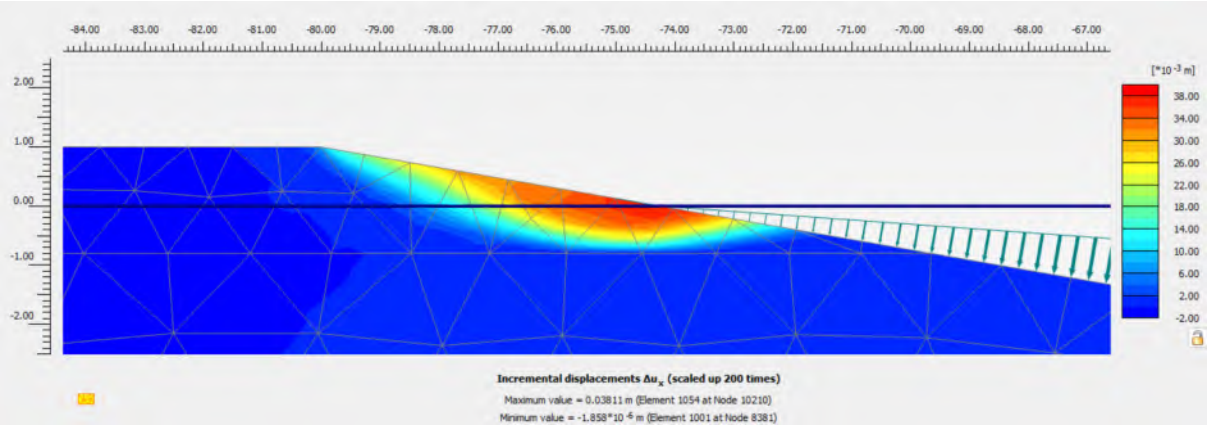


Figure 4.5a: Enlarged EC7 SLS FoS Incremental Displacement Plot (x-direction) – Condition 1

With consideration of Condition 2, the factor of safety at a HAT tidal level was calculated to be of a greater magnitude than that of LAT. This is principally due to the consistent gradient of the dredge slope throughout the upper intertidal zone, as well as the increased friction angle of the shallower deposits. From review of the modelling outputs, the failure mechanism was observed to propagate from the lower section of the dredge side slopes, based upon the pre-existing profile. Within this condition, the failure mechanism was observed to propagate through the Medium-Dense Sands as shown within Figure 4.6. With consideration of the phi/c reduction method, factoring down the tangent of the friction angle, utilising the FoS within this condition equates to a friction angle of 9.3°.

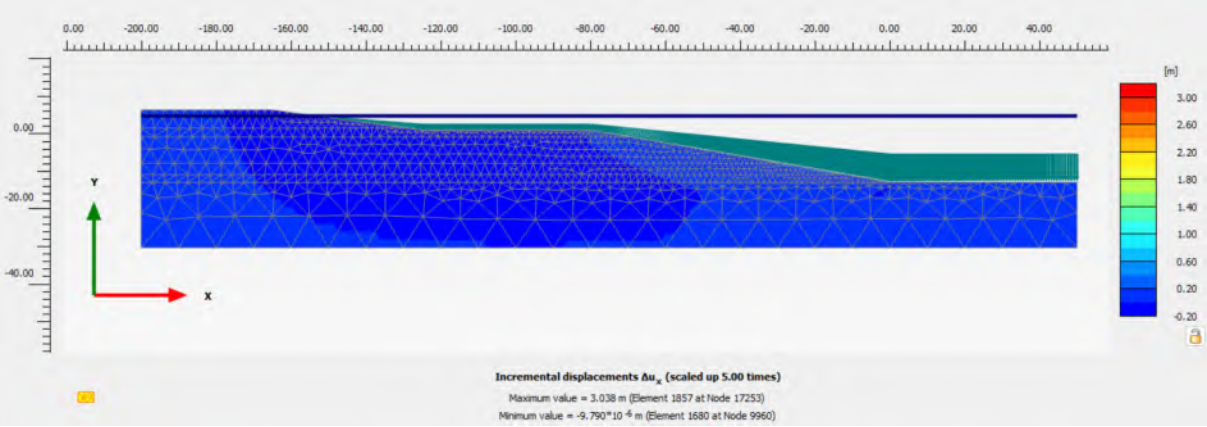


Figure 4.6: EC7 SLS FoS Incremental Displacement Plot (x-direction) – Condition 2

The factor of safety calculated within Condition 3 was of a comparable magnitude to that of Condition 1, due to the LAT level being located close to the transition of the gradient between the pre-existing material (graded at 1:6) and the reinstatement material (graded at 1:8). The highlighted failure mechanism propagates from the Medium-Dense Sand (Silty) as shown within Figure 4.7 & 4.7a. As a result of the phi/c reduction method, factoring down the tangent of the friction angle, utilising the FoS within this condition equates to the same friction angle of 11.8°.

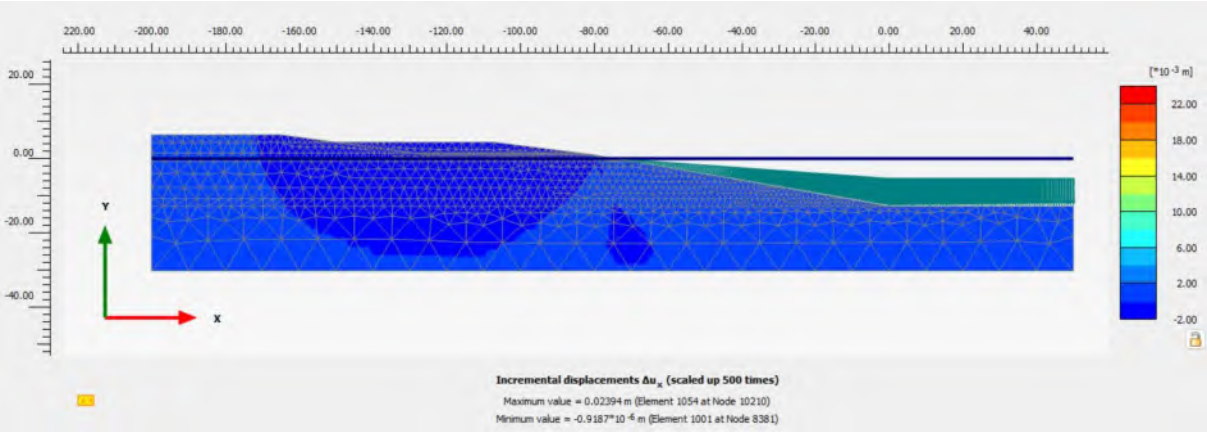


Figure 4.7: EC7 SLS FoS Incremental Displacement Plot (x-direction) – Condition 3

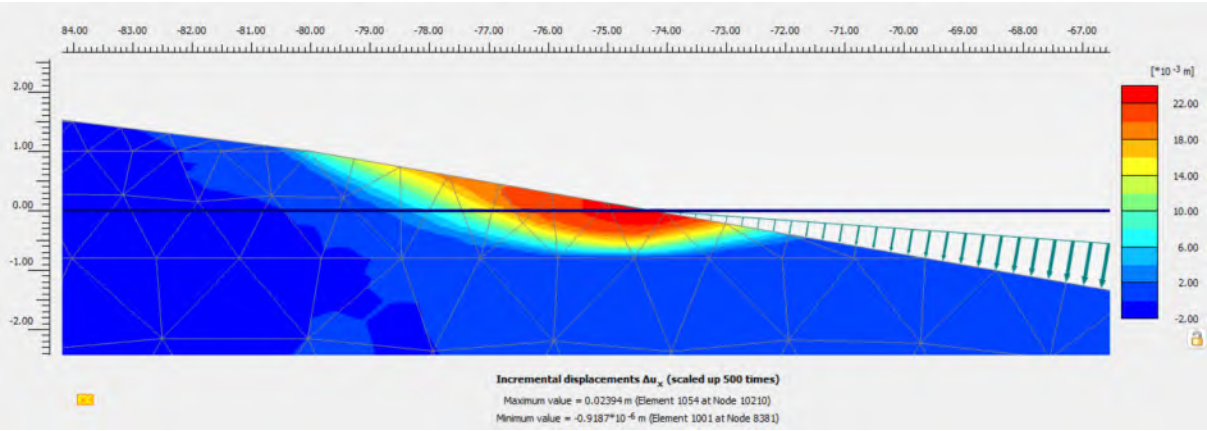


Figure 4.7a: Enlarged EC7 SLS FoS Incremental Displacement Plot (x-direction) – Condition 3

The factor of safety calculated within Condition 4 was of a comparable magnitude to that of Condition 2, due to the HAT level being located in close proximity to the finished level of the reinstated material. From review of the modelling outputs, the failure mechanism was observed to propagate from the transition in gradient between the pre-existing material (graded at 1:6) and the reinstatement material (graded at 1:8). From review of the modelling outputs, the failure mechanism within this condition was observed to propagate from the lower Medium-Dense Sands of the dredge side slope, based upon the profile following the reinstatement works, as shown within Figure 4.8 & 4.8a. With consideration of the phi/c reduction method, factoring down the tangent of the friction angle, utilising the FoS within this condition equates to a friction angle of 9.3°, as calculated from the results of Condition 2.

In line with the obtained results, it is envisaged that under operational and prevailing active water conditions, the slope would likely form an evenly graded slope between the toe and crest of the side slope alignments.

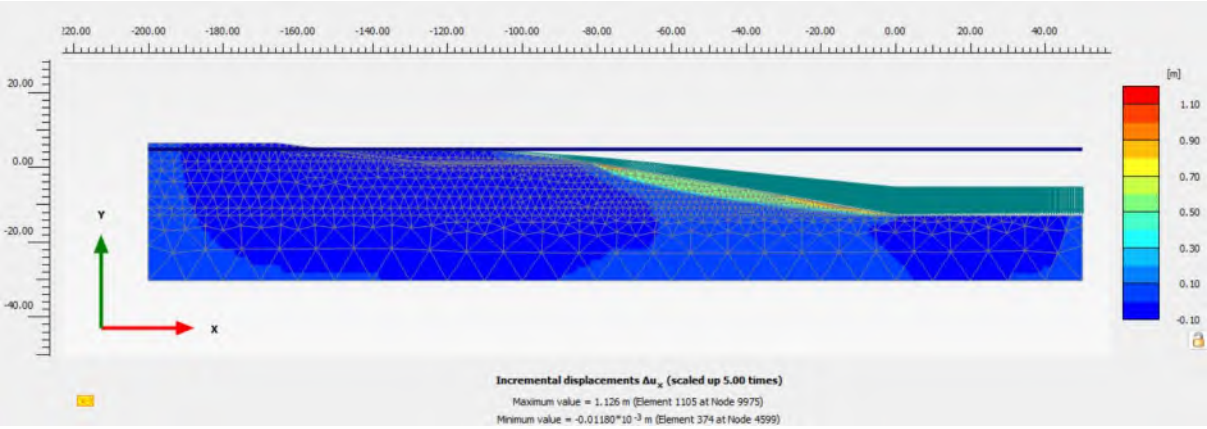


Figure 4.8: EC7 SLS FoS Incremental Displacement Plot (x-direction) – Condition 4

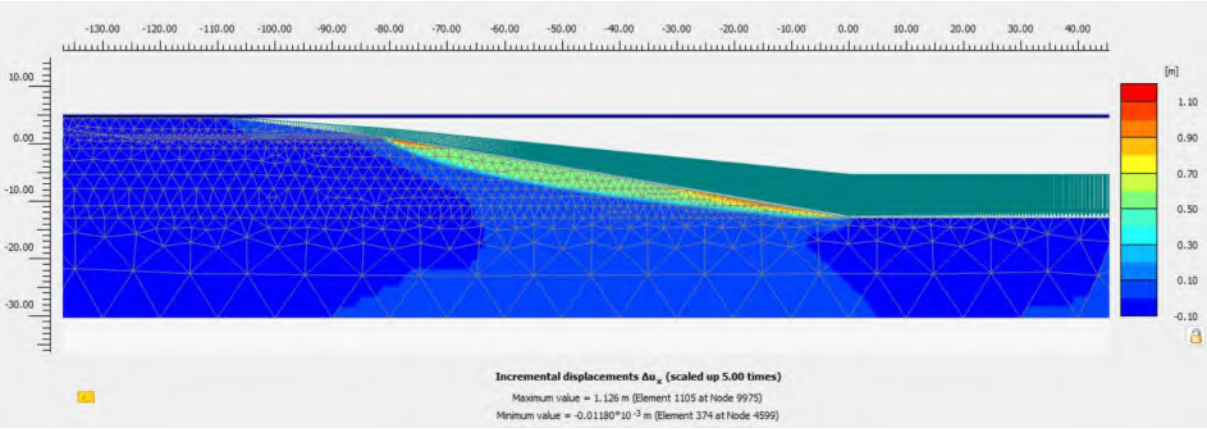


Figure 4.8a: Enlarged EC7 SLS FoS Incremental Displacement Plot (x-direction) – Condition 4

The factor of safety calculated within Condition 5 was of a lesser magnitude than calculated in Condition 6, due to the LAT level being located in very close proximity to the crest of the lower dredge side slope, based upon the pre-existing profile. Within Condition 5 the failure mechanism was observed to propagate from within the Medium-Dense Sand (Silty) as shown within Figure 4.9 & 4.9a. With consideration of the phi/c reduction method, factoring down the tangent of the friction angle, utilising the FoS within this condition equates to a friction angle of 11.7°.

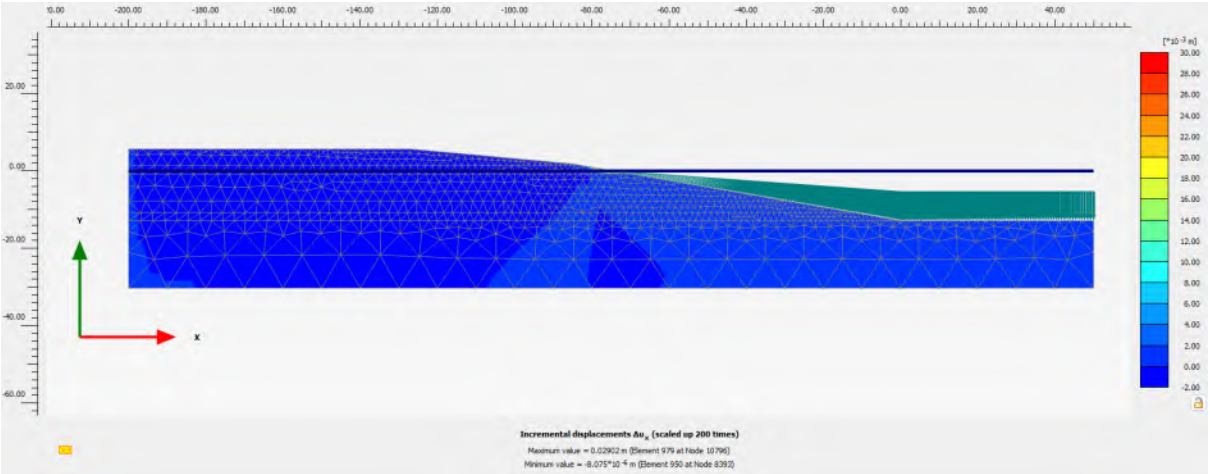


Figure 4.9: EC7 SLS FoS Incremental Displacement Plot (x-direction) – Condition 5

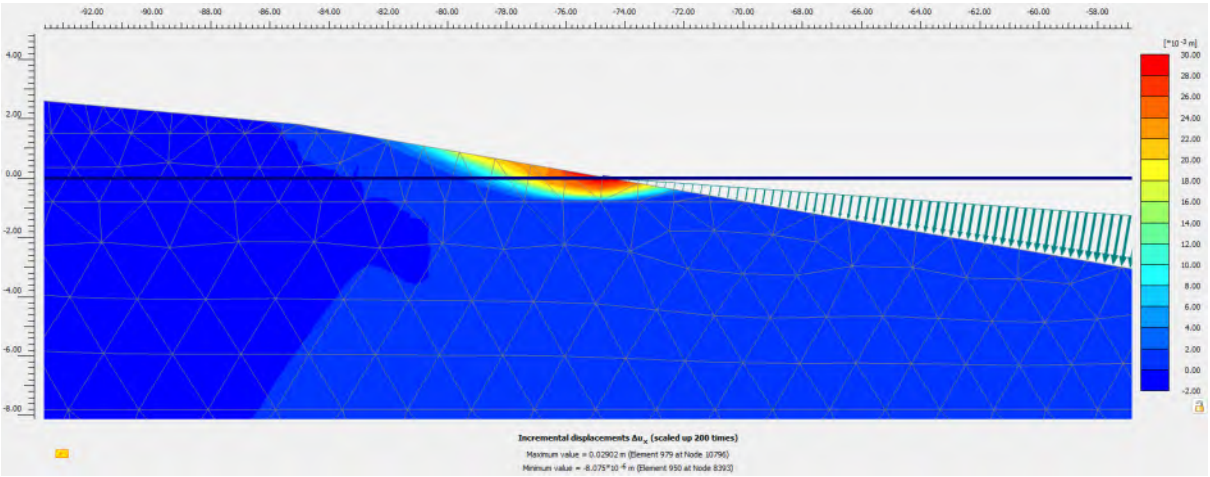


Figure 4.9a: Enlarged EC7 SLS FoS Incremental Displacement Plot (x-direction) – Condition 5

With consideration of Condition 6, the factor of safety at a HAT tidal level was calculated to be of a greater magnitude than that of LAT. This is principally due to the increased friction angle of the shallower deposits. From review of the modelling outputs, the failure mechanism was observed to propagate from the upper section of the dredge side slopes, where the proposed dredging aligns with the existing spit, based upon the pre-existing profile. Within this condition, the failure mechanism was observed to propagate through the Medium-Dense Sand (Silty) as shown within Figure 4.10 & 4.10a. With consideration of the phi/c reduction method, factoring down the tangent of the friction angle, utilising the FoS within this condition equates to a friction angle of 9.7°.

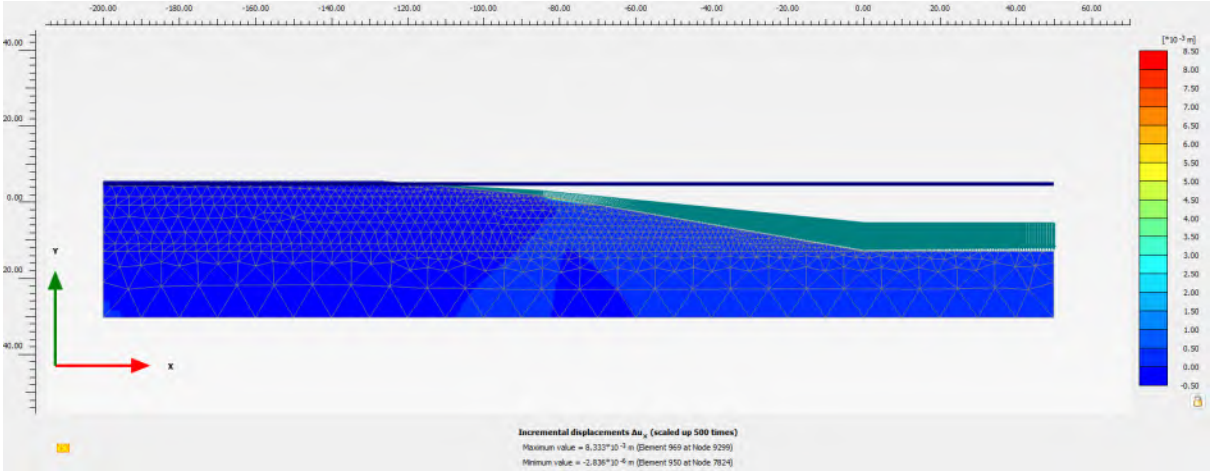


Figure 4.10: EC7 SLS FoS Incremental Displacement Plot (x-direction) – Condition 6

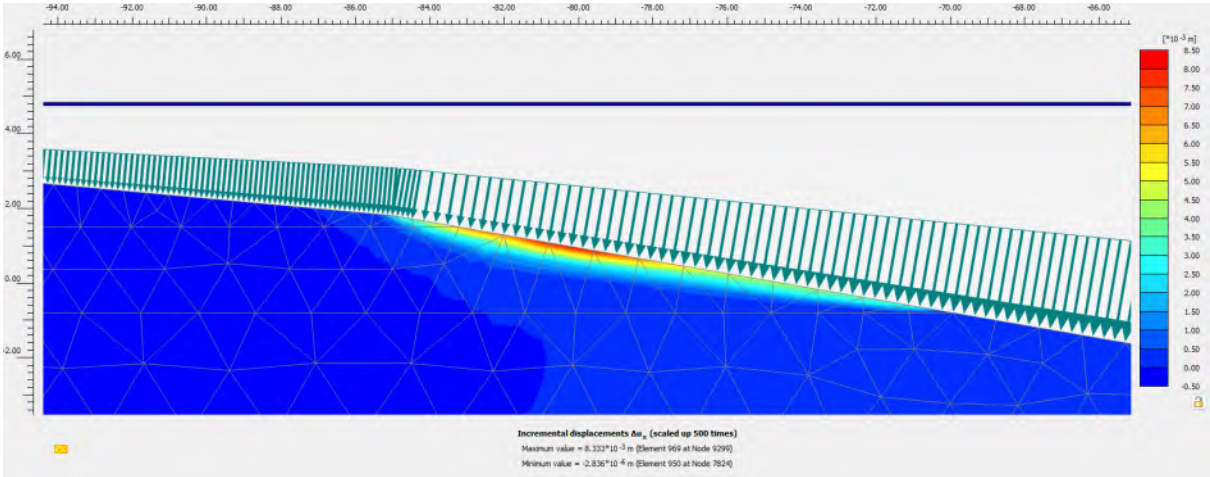


Figure 4.10a: Enlarged EC7 SLS FoS Incremental Displacement Plot (x-direction) – Condition 6

4.4 Assessment Findings Discussion

The enclosed analysis has been undertaken utilising still water conditions, however these findings will require contextualisation in active water conditions. BS6349-1-3:2012 details typical side slopes for Coarse Sands & Fine Sands in both still and active water conditions. These gradients are reproduced within Table 4.2.

Material Type	Typical Side Slope		Ratio of Typical Side Slope
	Still Water	Active Water	
Coarse Sands	20° (1 : 2.75)	10° (1 : 5.67)	2.06 : 1
Fine Sands	15° (1 : 3.73)	5° (1 : 11.43)	3.06 : 1

Table 4.2: Typical side slopes for selected stratification reproduced from BS6349-1.3:2012 (Table 1)

A further variation to the analysis was undertaken to derive the slope angles at which the FoS/ODF of 1.0 are achieved in still water conditions. In line with the particle size distributions from the previous ground investigation undertaken on the spit, a comparison has been made to the slope angles of Fine Sands due to the failure mechanism propagating from the fine grain sands close to the toe of the slope. This has utilised a gradient of 1:2 through the depth of the pre-existing sands whilst a gradient of 1:2.5 was adopted through the depth of reinstated material.

Condition	EC7 DA1 C2 (FoS / ODF)	Required Slope Gradients for Fine Sand in Active Water Conditions (factor = 3.06)
3	1.068	1 : 5.73– Natural Superficials 1 : 7.16 – Reinstatement Material
4	1.166	1 : 5.25 – Natural Superficials 1 : 6.56 – Reinstatement Material
5	1.030	1 : 5.94 – Natural Superficials
6	1.150	1 : 5.32 – Natural Superficials

Table 4.3: Derived side slopes for active water conditions

From review of the derived side slopes in active water conditions in comparison with the inputted dredge side slopes to the modelling completed, there is a high degree of agreement. The dredge slopes within the natural superficial deposits were modelled at a marginally steeper angle than required based upon BS6349-1-3:2012. Through the depth of reinstatement material, the modelled angle of side slope was marginally shallower than that derived from this standard.

5.0 Conclusions

In conclusion of this initial assessment, it is considered the dredge side slopes within the footprint of Phase 2 may be graded at 1:6 through the depth of natural superficial deposits, whilst the reinstatement material imported to the spit may be graded at 1:8 through their prevailing depth. From review of the existing ground investigation findings from within Phase 1, in conjunction with the surveyed profiles provided by Haventus Group, it can be demonstrated the spit will remain stable when subject to active water conditions at these gradients.

It should be expressly noted the initial assessment findings are undertaken with reference to Chainage 700 & Chainage 1100 within the spit, and further chainages will require analysis in order to review the factor of safety from these locations, whilst reflecting the varying bathymetry and topography throughout the extent of the spit, in conjunction with prevailing tidal levels. Furthermore, in the context of this initial assessment, the impacts of vessel thruster induced scour have not been reviewed, however it is recognised that owing to the typically fine grain granular nature of the natural superficial and reinstatement material within the side slopes, these are highly susceptible to becoming suspended within the channel. These will be reviewed once vessel data has been confirmed.

The findings of this assessment should be read in the context of the following engineering judgements made in preparing this document:

- The ground conditions within the footprint of the Phase 2 are assumed to be broadly comparable to those encountered within Phase 1, with little variation in the material properties, layering and grading of the superficial deposits, including those above MHWS which cannot be investigated due to prevailing protections on the spit;
- The performance of the reinstatement material has been considered to be as stated within Table 3.1. These parameters will require refinement (as necessary), based upon the findings of the Phase 2 Marine Ground Investigation works;
- The bathymetric and topographic data provided by Haventus Group, survey: 'ACAD-NAV-CHAN-Model' are assumed to be an accurate reflection of the existing profile of the spit prior to the reinstatement works. The levels of the reinstatement works are assumed to be reflective of that currently onsite;

In lieu of construction drawings explicitly showing the intent of the reinstatement works, the following risks are highlighted; whilst these can be partially mitigated from ground investigation works, these may remain inherent to the dredged side slopes, where construction drawings of the reinstatement works cannot be provided:

- It is envisaged that in order to prevent planar failure(s) of the dredge slopes, preparatory works entailed benching of the existing natural sands prior to placement of the reinstatement material, thereby mitigating the risk of planar failure which may be induced from a slope inclined towards the proposed channel. Placement upon an inclined slope would significantly increase the likelihood of planar failures as the spit material would not appropriately interlock with the reinstated material;
- Similarly, there is scope for variation in the moisture content of the reinstatement material, from that of its origin location, which may occur through the dredging and placement process. There is an inherent risk that under self-surcharge and settlement, the reinstatement material may fail by piping as the moisture content is pushed to the surface of the slope. From modelling undertaken within this assessment, there is noted to be a marginal degree of settlement which should be anticipated within the reinstatement material. This action is highly subjective to the

permeability of the sands (testing to be undertaken as part of the Phase 2 Marine GI), however the shallower deposits of sands are most vulnerable to this form of failure as a result of the lesser magnitude of self-surcharge;

- In addition, there is also a further risk that shallow piping failure of the dredge slope may occur due to the lack of practicable methods by which to compact the material when placed. As a result, there is potential by which cohesion of the sands (particularly with a higher silt content) may result in the arching of deposited material, which may subsequently be disturbed by variation in tidal levels, passing vessels or prevailing waves within the channel;

6.0 References

BS6349-1-1:2013 – Maritime Works – General – Code of practice for Planning and design of Operations;

BS6349-1-3:2021 – Maritime Works – General – Code of practice for Geotechnical Design;

BS6349-5:2016 – Maritime Works – Code of practice for Dredging & Land Reclamation;

Eurocode 7 - Geotechnical Design - Part 1, General Rules (and National Annex);

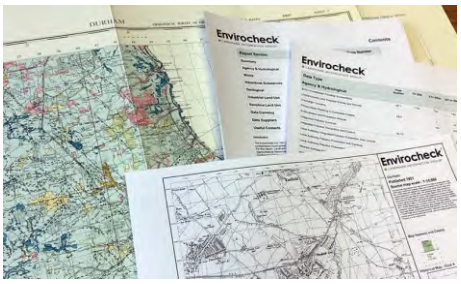
PIANC WG180 (2015) - Guidelines for protecting berthing structures from scour caused by ships;

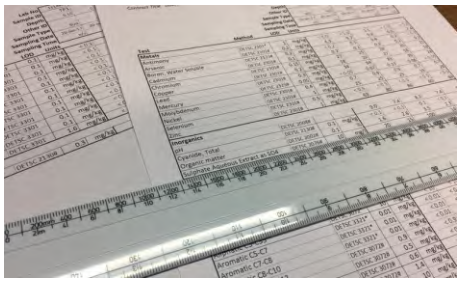
Mayne, P.W. 2001. Stress-strain-strength-flow parameters from enhanced in-situ tests. Proceedings, International Conference on In-Situ Measurement of Soil Properties & Case Histories [In-Situ 2001], Bali, Indonesia, May 21-24, 2001, pp. 27-48;

Appendix A – Site Investigation Works

Solmek Ltd:

Ardersier Port (Scotland) Ltd, Ardersier Port, Inverness – Factual Site Investigation Report, Issue 4, Dated: March 2024, Status: Final;





Phase 2: Site Investigation

Ardersier Port, Spit Boreholes, Inverness

Ardersier Port (Scotland) Ltd

S230503

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ISO 9001:2015 Quality Management
ISO 14001:2015 Environmental Management
ISO 45001 Occupational Health and Safety Management
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PHASE 2 SITE INVESTIGATION REPORT

ARDERSIER PORT, SPIT BOREHOLES INVERNESS

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Appendix C: Geotechnical Laboratory Results
Appendix D: Falling Head Test Results
Appendix E: Groundwater Data Log Summary
Appendix F: Notes on Limitations

Revision	Date	Prepared by	Signed
Final	March 2024	A Cutts *Senior Engineering Geologist*	
		Checked by	
		R Woods *Principal Geotechnical Engineer*	
		Approved by	
		R Woods *Principal Geotechnical Engineer*	

1 INTRODUCTION

1.1 Authorisation

The site investigation described in this report was carried out by Solmek to the instructions of ARUP on behalf of Haventus, Ardersier Port (Scotland) Ltd, on the spit area of land located at Ardersier Port to the east of Inverness.

A site location plan is presented in Appendix A, Figure 1.

1.2 Background & Scope of Works

The port is to become an Energy Transition Facility involving the recycling of old oil rigs to be used as foundations for floating offshore wind farms. The proposed development will also include a concrete production plant using dredged sand from the port inlet.

This phase of works concerns investigating the spit extending into the Moray Firth. A series of boreholes were required along the spit to determine its composition at depth and to provide geotechnical parameters to determine its integrity as a natural breakwater following dredging works in the main channel.

The following steps may be required in the investigation and remediation of potentially contaminated land:

- Phase 1: Desk Study
- Phase 2: Intrusive Investigation
- Phase 3: Remediation Statement
- Phase 4: Validation Reports

Phases 1 and 2 are generally required in the redevelopment of most sites. Phases 3 and 4 are subject to the findings of the initial stages.

A factual geotechnical report (Phase 2) was requested. The fieldwork and testing was generally carried out according to:

- BS 5930:2015+A1:2020 Code of Practice for Ground Investigations
- Rock and soil descriptions shall be in accordance with BS EN ISO 14689-1:2003, BS EN ISO 14688-1:2002 and BS EN ISO 14688-2:2004

This report forms part of a Stage 1 Risk Assessment (Generic Quantitative Risk Assessment) with respect to the Environment Agency's guidance document Environment Agency *Land Contamination Risk Management*, which replaced the now-withdrawn *Contaminated Land Report 11 – Model Procedures for the Management of Land Contamination (2004)*.

The information provided in this report is based on the investigation fieldwork and is subject to the comments and approval of the various regulatory authorities. There may be other conditions prevailing on the site which have not been disclosed by this investigation and which have not been taken into account by this report. Solmek reserve the right to alter conclusions and recommendations should further information be available or provided.

Any schematic representation or opinion of the possible configuration of ground conditions between exploratory holes is conjectural and given for guidance only and confirmation of intermediate ground conditions should be considered if deemed necessary.

2 SITE DESCRIPTION AND FIELDWORK

A initial site inspection, as recommended in BS 5930 and BS 10175, was undertaken on 23rd May 2023.

The site is centred at Ordnance Survey Co-ordinates 280420E, 858666N and lies immediately north east of Ardersier Port dock area. The spit is of generally sand and gravel construction which lies parallel to the dock side extending into the mouth of the Moray Firth.

2.1 Fieldwork

The drilling fieldwork was carried out between 23rd May and 6th July 2023. The extent of the investigation was:

- 5no. cable percussive boreholes (BHSP05 to BHSP09 inclusive) drilled to a maximum depth of 40.00m below ground level (bgl).
  - The boreholes were positioned by the client to target areas along the length of the spit in order to assess the deep ground conditions.
- Groundwater monitoring wells were installed in 2no. boreholes (BHSP07 & BHSP08).
  - Groundwater data logging was undertaken between October 2023 and February 2024 (Appendix E).
  - Falling head testing in BHSP07 & BHSP08 (Appendix D).
- In-situ testing in the boreholes as Standard Penetration Tests (SPTs).
- Retrieval of disturbed and undisturbed samples (attempted) for geotechnical testing.

The boreholes were backfilled with bentonite grout and monitoring installations upon completion.

Descriptions of the strata encountered in the boreholes together with details of sampling and groundwater are presented in Appendix B of this report.

A plan showing all exploratory locations can be found in Appendix A, Figure 2. It should be noted that these are indicative locations and have not, as yet, been surveyed.

3 GROUND CONDITIONS

A summary of the ground conditions encountered is given below.

3.1 Made Ground Deposits

Not proven.

3.2 Superficial Deposits

The superficial deposits generally comprised the following stratum units.

TABLE 1: NATURAL SUPERFICIAL GEOLOGY

Stratum	Base Depth (mbgl)	Details
Sandy GRAVEL	2.40-2.70mbgl	Noted from surface level in SPBH05 & SPBH08. Medium dense to dense light brown to dark grey slightly sandy to very sandy gravel with occasional inferred cobbles. The gravel and cobble fractions consisted of mixed lithologies including sandstone, limestone and mudstone.
Gravelly SAND	5.00-9.00mbgl	Noted in SPBH09. Dense brown and grey slightly gravelly to gravelly sand. The gravel fractions consisted of mixed lithologies including sandstone, limestone and mudstone.
Silty sandy GRAVEL	5.00-27.00mbgl	Medium dense to dense light brown to dark grey slightly silty very sandy gravel. The gravel fractions consisted of mixed lithologies including sandstone, limestone and mudstone.
Silty gravelly SAND	1.50-35.00mbgl	One of the main stratum units, this comprised very loose to very dense light brown to dark grey locally black slightly silty to silty slightly gravelly to very gravelly sand. The gravel fractions consisted of mixed lithologies including sandstone, limestone, mudstone and shell fragments.
Silty SAND	2.40-40.00mbgl	One of the main stratum units, this comprised medium dense to very dense light brown to dark grey slightly silty to silty sand.

3.3 Bedrock

Not proven.

3.4 Groundwater

Groundwater strikes are shown in Table 2 below.

TABLE 2: GROUNDWATER RECORDS FROM BOREHOLES DURING FIELDWORK

Location	Depth of Strike (mbgl)	Stratum
BHSP05	3.60	Silty SAND
BHSP06	4.50	Silty gravelly SAND
BHSP07	6.40	Silty gravelly SAND
BHSP08	3.10	Silty gravelly SAND
BHSP09	3.20	Silty sandy GRAVEL

The rapid rate of advancement of the exploratory holes may mask minor seepages and it should be borne in mind that water levels fluctuate with a number of influences including tides, season, rainfall, dewatering and pumping activities.

Therefore, water levels significantly higher than those found during this investigation may be encountered.

4 GEOTECHNICAL TESTING

Samples taken from the boreholes underwent a series of geotechnical tests to aid design and soil description.

In addition, insitu Standard Penetration Tests (SPTs) were undertaken at regular intervals during drilling.

4.1 Laboratory Testing

The full scope of the laboratory testing (requested by ARUP) is presented below along with the respective testing laboratories.

The results are presented in Appendix D with a summary of selected geotechnical properties by depth range presented in Table 3.

G2M Testing Ltd, 12-16 Yarm Rd, Stockton on Tees, TS18 3NA

- 77no. Moisture Contents
- 77no. Particle Size Distribution

Geolabs, Bucknalls Lane, Watford, Hertfordshire, WD25 9XX

- 20no. Min/Max Relative Density
- 11no. Shear Box Tests (set of three specimens per test)
- 9no. Consolidated Drained Multistage Triaxial Compression Tests

TABLE 3: SUMMARY OF GEOTECHNICAL TEST DATA BY DEPTH

General Stratigraphy	Depth Range (mbgl)		Test Type	Parameters Range
	From	To		
Sandy GRAVEL Gravelly SAND Silty sandy GRAVEL Silty gravelly SAND Silty SAND	0.00	10.00	SPT N Value	11-45
			Moisture Content	1.80-23%
			(Min) Max Dry Density	(1.20-1.30g/cm^3) 1.58-1.65g/cm^3
			Small Shear Box Φ (Ap Cohesion)	33.5-39° (1-6kPa)
			Sand Con Drained Tx Φ (Cohesion)	36-39.5° (3.30kPa)
Silty sandy GRAVEL Silty gravelly SAND Silty SAND	10.00	20.00	SPT N Value	2-50
			Moisture Content	18-32%
			(Min) Max Dry Density	(1.13-1.22g/cm^3) 1.54-1.65g/cm^3
			Small Shear Box Φ (Ap Cohesion)	32.5-35° (1-9kPa)
			Sand Con Drained Tx Φ (Cohesion)	35-37° (0-3.60kPa)
Silty sandy GRAVEL Silty gravelly SAND Silty SAND	20.00	30.00	SPT N Value	20-50
			Moisture Content	9.30-25%
			(Min) Max Dry Density	(1.13-1.24g/cm^3) 1.60-1.71g/cm^3
			Small Shear Box Φ (Ap Cohesion)	33-37.5° (1-9kPa)
			Sand Con Drained Tx Φ (Cohesion)	34° (0kPa)
Silty sandy GRAVEL Silty gravelly SAND Silty SAND	30.00	40.00	SPT N Value	29-50
			Moisture Content	14-26%

4.2 Percolation Tests

A series of falling head tests were undertaken in BHSP07 & BHSP08 across the site. The boreholes were filled with water and the time for the water to fall back to natural groundwater level was recorded.

Table 4 summarises the range of soil infiltration rates.

TABLE 4 : SUMMARY OF FALLING HEAD TESTS

Borehole (Depth)	Soil Infiltration Rate (x 10^{-6}ms)
BHSP07 (10.00mbgl)	0.0103
BHSP07 (20.00mbgl)	0.00795
BHSP07 (35.00mbgl)	0.000895
BHSP08 (10.00mbgl)	0.000935
BHSP08 (21.00mbgl)	0.000120

The full results are presented in Appendix D.

5 GROUNDWATER MONITORING

During the site investigation works, groundwater monitoring wells were installed within SPBH07 & SPBH08, at the request of ARUP. Data loggers were placed into the wells and were monitored over a four month period between October 2023 and February 2024 with readings taken every 15 minutes.

A summary of the results is presented in Appendix E.

APPENDIX A

SOLMEK
12-16 Yarm Road, Stockton on Tees, TS18 3NA
Tel: 01642 607083 Email: info@solmek.com

Figure Title

Site Location Plan

Project Number

S230503

Project Name

Spit Boreholes - Ardersier Port, Inverness

Client

Ardersier Port

Date

March 2024

DRG Number

Figure 1

Scale

1:51500 @ A4 [DO NOT SCALE]

Legend Key

Project Bounds - Project Bounds

SOLMEK
12-16 Yarm Road, Stockton on Tees, TS18 3NA
Tel: 01642 607083 Email: info@solmek.com

Figure Title

BH Location Plan

Project Number

S230503

Project Name

Spit Boreholes - Ardersier Port, Inverness

Client

Ardersier Port

Date

March 2024

DRG Number

Figure 2

Scale

1:6000 @ A4 [DO NOT SCALE]

Legend Key

Locations By Type - BH

Project Bounds - Project Bounds

APPENDIX B

SOLMEK
12-16 Yarm Road
Stockton on Tees
TS18 3NA
01642 607083
info@solmek.com

Borehole Log

Scale 1:100 Sheet 1 of 2

BH-SP05

Contract no:	S230503	**Site:**	Spit Boreholes - Ardersier Port, Inverness	**Driller:**	Bainbridge Brothers Ltd
				Plant used:	Dando 2000
				Started:	23/06/2023
Client:	Ardersier Port			**Ended:**	06/07/2023
Method:	Cable Percussive			**Backfilled:**	06/07/2023

GL (AOD):		
Easting:	280799	
Northing:	858470	
Logged:	SM	
Status:	FINAL	

Backfill / Installation	Legend	Depth (m)	Level (m AOD)	Stratum Description	Samples and Insitu Testing		
					Depth (m)	Type	Results
				Dense dark grey to greyish brown slightly sandy GRAVEL with an inferred low cobble content. Sand is fine to coarse. Gravel is fine to coarse subangular to well rounded of mixed lithologies including sandstone, mudstone and limestone. Cobbles are subrounded to rounded of mixed lithologies including sandstone, mudstone, limestone.	0.30	B	
					0.80	B	
					1.20 - 1.65	SPT (S)	N=30 (3,6/7,7,8,8)
					1.20	B + D	
					2.00 - 2.45	SPT (S)	N=39 (4,9/9,9,10,11)
					2.00	B + D	
		2.70		Medium dense brown slightly silty SAND. Sand is fine to coarse.	3.00 - 3.45	SPT (S)	N=13 (1,1/2,2,4,5)
					3.00	B + D	
					4.00 - 4.45	SPT (S)	N=17 (2,2/3,3,4,7)
					4.00	B + D	
		5.00		Medium dense brown slightly silty slightly gravelly SAND. Sand is fine to coarse. Gravel is fine to coarse subangular to well rounded of mixed lithologies including sandstone, mudstone and limestone.	5.00 - 5.45	SPT (S)	N=22 (1,2/4,5,5,8)
					5.00	B + D	
					6.00 - 6.45	SPT (S)	N=12 (2,3/3,2,3,4)
					6.00	B + D	
					7.00 - 7.45	SPT (S)	N=19 (2,3/3,5,6,5)
					7.00	B + D	
					8.00 - 8.45	SPT (S)	N=21 (3,5/5,5,6,5)
					8.00	B + D	
					9.00 - 9.45	SPT (S)	N=25 (3,4/5,7,7,6)
					9.00	B + D	
					10.00 - 10.45	SPT (S)	N=19 (2,3/3,4,6,6)
					10.00	B + D	
					10.50 - 10.95	SPT (S)	N=28 (2,4/7,7,7,7)
					10.50	B + D	
		12.00		Medium dense to dense dark grey to brown slightly silty slightly gravelly SAND. Sand is fine to coarse. Gravel is fine to coarse subangular to well rounded of mixed lithologies including sandstone, mudstone and limestone.	12.00 - 12.45	SPT (S)	N=37 (3,5/8,8,9,12)
					12.00	B + D	
					13.50 - 13.95	SPT (S)	N=29 (4,7/7,6,7,9)
					13.50	B + D	
		15.00		Dense dark grey slightly silty SAND. Sand is fine to coarse.	15.00 - 15.45	SPT (S)	N=30 (2,2/5,7,7,11)
					15.00	B + D	
					16.50 - 16.95	SPT (S)	N=38 (3,8/8,9,9,12)
					16.50	B + D	
					18.00 - 18.45	SPT (S)	N=42 (7,9/9,11,10,12)
					18.00	B + D	
					19.50 - 19.95	SPT (S)	N=32 (6,6/7,8,8,9)
					19.50	B + D	

Hole Diameter

Depth Base (m)	Diameter (mm)
10.00	250
22.50	200
40.00	150

Casing Depths

Depth Base (m)	Diameter (mm)
10.00	250
22.50	200
40.00	150

General Remarks

1.2m Hand excavated inspection pit dug.
Groundwater encountered at 3.60m.
Borehole backfilled on completion.

Chiselling

From (m)	To (m)	Time (hr)

Ground Water

Depth Strike (m)	Depth Casing (m)	Depth Sealed (m)	Time Elapsed (min)	Water Level (m)
3.60	3.60		20	3.55

SOLMEK
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Borehole Log

Scale 1:100 Sheet 2 of 2

BH-SP05

Contract no:	S230503	**Site:**	Spit Boreholes - Ardersier Port, Inverness	**Driller:**	Bainbridge Brothers Ltd
				Plant used:	Dando 2000
				Started:	23/06/2023
Client:	Ardersier Port			**Ended:**	06/07/2023
Method:	Cable Percussive			**Backfilled:**	06/07/2023

GL (AOD):		
Easting:	280799	
Northing:	858470	
Logged:	SM	
Status:	FINAL	

Backfill / Installation	Legend	Depth (m)	Level (m AOD)	Stratum Description	Samples and Insitu Testing		
					Depth (m)	Type	Results
				Dense dark grey slightly silty SAND. Sand is fine to coarse.	21.00 - 21.45 21.00	SPT (S) B + D	N=36 (7,7/7,9,9,11)
					22.50 - 22.95 22.50	SPT (S) B + D	N=35 (4,6/8,9,9,9)
					24.00 - 24.45 24.00	SPT (S) B + D	N=39 (7,9/10,9,10,10)
					25.50 - 25.95 25.50	SPT (S) B + D	N=32 (3,6/7,8,7,10)
					27.00 - 27.45 27.00	SPT (S) B + D	N=41 (5,7/9,10,10,12)
					28.50 - 28.95 28.50	SPT (S) B + D	N=41 (8,8/9,11,11,10)
					30.00 - 30.45 30.00	SPT (S) B + D	N=44 (2,4/7,9,13,15)
					31.50 - 31.95 31.50	SPT (S) B + D	N=37 (5,9/9,9,9,10)
					33.00 - 33.45 33.00	SPT (S) B + D	N=36 (10,9/9,8,9,10)
		34.50		Dense to very dense grey slightly silty SAND. Sand is fine to coarse.	34.50 - 34.94 34.50	SPT (S) B + D	N=50+ (4,13/13,14,16,7 for 70mm)
					36.00 - 36.45 36.00	SPT (S) B + D	N=31 (5,5/5,8,8,10)
					37.50 - 37.95 37.50	SPT (S) B + D	N=43 (4,6/8,11,11,13)
					39.00 - 39.44 39.00	SPT (S) B + D	N=50+ (7,8/9,10,15,16 for 65mm)
		40.00		End of Borehole at 40.000m			

Hole Diameter

Depth Base (m)	Diameter (mm)
10.00	250
22.50	200
40.00	150

Casing Depths

Depth Base (m)	Diameter (mm)
10.00	250
22.50	200
40.00	150

General Remarks

1.2m Hand excavated inspection pit dug.
Groundwater encountered at 3.60m.
Borehole backfilled on completion.

Chiselling

From (m)	To (m)	Time (hr)

Ground Water

Depth Strike (m)	Depth Casing (m)	Depth Sealed (m)	Time Elapsed (min)	Water Level (m)
3.60	3.60		20	3.55

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Borehole Log

Scale 1:100 Sheet 1 of 2

BH-SP06

Contract no:	S230503	**Site:**	Spit Boreholes - Ardersier Port, Inverness	**Driller:**	Bainbridge Brothers Ltd
				Plant used:	Damdo 2000
				Started:	12/06/2023
Client:	Ardersier Port			**Ended:**	23/06/2023
Method:	Cable Percussive			**Backfilled:**	23/06/2023

GL (AOD):	
Easting:	280604
Northing:	858567
Logged:	SM
Status:	FINAL

Backfill / Installation	Legend	Depth (m)	Level (m AOD)	Stratum Description	Samples and Insitu Testing		
					Depth (m)	Type	Results
				Medium dense light brown to brown slightly silty gravelly SAND. Sand is fine to coarse. Gravel is fine to coarse subangular to well rounded of mixed lithologies including sandstone, mudstone and limestone.	0.30	B	
					0.80	B	
					1.20 - 1.65	SPT (S)	N=18 (3,3/3,4,5,6)
		1.50		Medium dense brown slightly silty slightly gravelly SAND. Sand is fine to coarse. Gravel is fine to coarse subangular to well rounded of mixed lithologies including sandstone, mudstone and limestone.	1.20	B+D	
					2.00 - 2.45	SPT (S)	N=27 (3,4/6,7,7,7)
					2.00	B+D	
					3.00 - 3.45	SPT (S)	N=21 (4,4/4,4,6,7)
					3.00	B+D	
					4.00 - 4.45	SPT (S)	N=24 (4,5/5,4,7,8)
					4.00	B+D	
		5.00		Dense brown slightly gravelly SAND. Sand is fine to coarse. Gravel is fine to coarse subangular to well rounded of mixed lithologies including sandstone, mudstone and limestone.	5.00 - 5.45	SPT (S)	N=30 (5,4/5,8,8,9)
					5.00	B+D	
					6.00 - 6.45	SPT (S)	N=32 (4,4/6,7,9,10)
					6.00	B+D	
					7.00 - 7.45	SPT (S)	N=39 (6,6/9,9,9,12)
					7.00	B+D	
					8.00 - 8.45	SPT (S)	N=36 (5,7/7,9,9,11)
					8.00	B+D	
		9.00		Dense to very dense brown slightly silty SAND. Sand is fine to coarse.	9.00 - 9.45	SPT (S)	N=33 (4,5/7,6,10,10)
					9.00	B+D	
					10.00 - 10.44	SPT (S)	N=50+
					10.00	B+D	(7,11/13,12,12,13 for 70mm)
					10.50 - 10.95	SPT (S)	N=36 (6,8/8,9,9,10)
					10.50	B+D	
		12.10		Medium dense to dense dark grey silty SAND. Sand is fine to coarse.	12.00 - 12.45	SPT (S)	N=40 (3,7/10,9,10,11)
					12.00	B+D	
					13.50 - 13.95	SPT (S)	N=24 (4,4/5,6,6,7)
					13.50	B+D	
					15.00 - 15.45	SPT (S)	N=27 (3,6/5,7,7,8)
					15.00	B+D	
					16.50 - 16.95	SPT (S)	N=32 (4,6/6,8,9,9)
					16.50	B+D	
		18.00		Dense dark grey silty slightly gravelly SAND. Sand is fine to coarse. Gravel is fine to coarse subangular to well rounded of mixed lithologies including sandstone, mudstone and limestone.	18.00 - 18.45	SPT (S)	N=39 (6,7/9,9,9,12)
					18.00	B+D	
					19.50 - 19.95	SPT (S)	N=41 (5,7/8,11,11,11)
					19.50	B+D	

Hole Diameter

Depth Base (m)	Diameter (mm)
10.00	250
24.00	200
40.00	150

Casing Depths

Depth Base (m)	Diameter (mm)
10.00	250
24.00	200
40.00	150

General Remarks

1.2m Hand excavated inspection pit dug,
Groundwater encountered at 4.50m.
Borehole backfilled on completion.

Chiselling

From (m)	To (m)	Time (hr)

Ground Water

Depth Strike (m)	Depth Casing (m)	Depth Sealed (m)	Time Elapsed (min)	Water Level (m)
4.50	4.50		20	4.34

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Borehole Log

Scale 1:100 Sheet 2 of 2

BH-SP06

Contract no:	S230503	**Site:**	Spit Boreholes - Ardersier Port, Inverness	**Driller:**	Bainbridge Brothers Ltd
				Plant used:	Damdo 2000
				Started:	12/06/2023
Client:	Ardersier Port			**Ended:**	23/06/2023
Method:	Cable Percussive			**Backfilled:**	23/06/2023

GL (AOD):	
Easting:	280604
Northing:	858567
Logged:	SM
Status:	FINAL

Backfill / Installation	Legend	Depth (m)	Level (m AOD)	Stratum Description	Samples and Insitu Testing		
					Depth (m)	Type	Results
				Dense dark grey silty slightly gravelly SAND. Sand is fine to coarse. Gravel is fine to coarse subangular to well rounded of mixed lithologies including sandstone, mudstone and limestone.	21.00 - 21.45 21.00	SPT (S) B+D	N=36 (7,6/8,9,9,10)
					22.50 - 22.95 22.50	SPT (S) B+D	N=42 (8,9/9,10,10,13)
		23.20		Dense dark grey slightly silty very sandy GRAVEL. Sand is fine to coarse. Gravel is fine to coarse subrounded to rounded of sandstone.	24.00 - 24.45 24.00	SPT (S) B+D	N=41 (5,7/7,12,12,10)
		24.70		Dense dark grey silty slightly gravelly SAND. Sand is fine to coarse. Gravel is fine to coarse subangular to well rounded of mixed lithologies including sandstone, mudstone and limestone.	25.50 - 25.95 25.50	SPT (S) B+D	N=40 (6,9/10,10,10,10)
		27.00		Dense to very dense dark grey slightly silty SAND.	27.00 - 27.45 27.00	SPT (S) B+D	N=43 (9,9/11,10,11,11)
					28.50 - 28.94 28.50	SPT (S) B+D	N=50+ (7,10/10,11,17,12 for 60mm)
					30.00 - 30.44 30.00	SPT (S) B+D	N=50+ (6,7/7,13,15,15 for 65mm)
					31.50 - 31.95 31.50	SPT (S) B+D	N=38 (7,8/8,9,10,11)
					33.00 - 33.44 33.00	SPT (S) B+D	N=50+ (9,10/9,17,17,7 for 70mm)
					34.50 - 34.78 34.50	SPT (S) B+D	N=50+ (4,11/27,23 for 50mm)
					36.00 - 36.37 36.00	SPT (S) B+D	N=50+ (5,8/19,24,7 for 70mm)
					37.50 - 37.77 37.50	SPT (S) B+D	N=50+ (11,13/26,24 for 45mm)
					39.00 - 39.44 39.00	SPT (S) B+D	N=50+ (2,5/8,15,16,11 for 70mm)
		40.00		End of Borehole at 40.000m			

Hole Diameter

Depth Base (m)	Diameter (mm)
10.00	250
24.00	200
40.00	150

Casing Depths

Depth Base (m)	Diameter (mm)
10.00	250
24.00	200
40.00	150

General Remarks

1.2m Hand excavated inspection pit dug,
Groundwater encountered at 4.50m.
Borehole backfilled on completion.

Chiselling

From (m)	To (m)	Time (hr)

Ground Water

Depth Strike (m)	Depth Casing (m)	Depth Sealed (m)	Time Elapsed (min)	Water Level (m)
4.50	4.50		20	4.34

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Borehole Log

Scale 1:100 Sheet 1 of 2

BH-SP07

Contract no:	S230503	**Site:**	Spit Boreholes - Ardersier Port, Inverness	**Driller:**	Bainbridge Brothers Ltd
				Plant used:	Dando 2000
				Started:	20/06/2023
Client:	Ardersier Port			**Ended:**	29/06/2023
Method:	Cable Percussive			**Backfilled:**	29/06/2023

GL (AOD):	
Easting:	280420
Northing:	858666
Logged:	SM
Status:	FINAL

Backfill / Installation	Legend	Depth (m)	Level (m AOD)	Stratum Description	Samples and Insitu Testing		
					Depth (m)	Type	Results
				Medium dense light brown slightly silty SAND. Sand is fine to coarse.	0.20 - 0.30	B	
					0.70 - 0.80	B	
					1.20 - 1.65	SPT (S)	N=11 (2,3/3,3,2,3)
					1.20 - 1.65	B + D	
					2.00 - 2.45	SPT (S)	N=16 (2,3/3,4,5,4)
		2.40			2.00 - 2.45	B + D	
				Medium dense light brown slightly silty slightly gravelly SAND. Sand is fine to coarse. Gravel is fine to coarse subangular to well rounded of mixed lithologies including sandstone, mudstone and limestone. Occasional shell fragments noted, frequent fine to coarse coal gravels noted.	3.00 - 3.45	SPT (S)	N=18 (3,4/5,4,5,4)
					3.00 - 3.45	B + D	
					4.00 - 4.45	SPT (S)	N=20 (4,5/4,5,6,5)
					4.00 - 4.45	B + D	
					5.00 - 5.45	SPT (S)	N=20 (4,6/4,5,5,6)
					5.00 - 5.45	B + D	
	G				6.00 - 6.45	SPT (S)	N=26 (4,6/7,6,7,6)
					6.00 - 6.45	B + D	
					7.00 - 7.45	SPT (S)	N=27 (6,7/6,6,7,8)
					7.00 - 7.45	B + D	
		8.00		Medium dense light brown slightly silty gravelly SAND. Sand is fine to coarse. Gravel is fine to coarse subangular to well rounded of mixed lithologies including sandstone, mudstone and limestone. Occasional shell fragments noted, frequent fine to coarse coal gravels noted.	8.00 - 8.45	SPT (S)	N=24 (4,5/5,6,6,7)
					8.00 - 8.45	B + D	
					9.00 - 9.45	SPT (S)	N=29 (6,7/9,8,7,5)
					9.00 - 9.45	B + D	
		10.10		Medium dense grey and locally light brown slightly silty SAND. Sand is fine to coarse. Occasional shell fragments noted.	10.10 - 10.20	B	
					10.50 - 10.95	SPT (S)	N=15 (1,1/0,5,5,5)
					10.50 - 10.95	B + D	
		12.00		Very dense grey slightly silty SAND. Sand is fine to coarse.	12.00 - 12.36	SPT (S)	N=50+ (5,8/14,16,20 for 60mm)
					12.00 - 12.45	B + D	
		13.50		Very dense grey and locally light brown silty gravelly SAND. Sand is fine to coarse. Gravel is fine to coarse subangular to well rounded of mixed lithologies including sandstone, mudstone and limestone.	13.50 - 13.88	SPT (S)	N=50+ (6,8/10,15,23,2 for 2mm)
					13.50 - 13.95	B + D	
		14.40		Occasional shell fragments noted. Dense to very dense dark grey slightly silty slightly gravelly SAND. Sand is fine to coarse. Gravel is fine to coarse subangular to rounded of mixed lithologies including sandstone, mudstone and limestone.	15.00 - 15.36	SPT (S)	N=50+ (6,7/13,17,20 for 55mm)
					15.00 - 15.45	B + D	
					16.50 - 16.95	SPT (S)	N=37 (4,7/8,10,9,10)
					16.50 - 16.95	B + D	
		18.00		Very loose dark grey locally grey slightly silty slightly gravelly SAND. Sand is fine to coarse. Gravel is fine to coarse subangular to well rounded of mixed lithologies including sandstone, mudstone and limestone. Rare shell fragments noted. Frequent fine to coarse coal gravels noted.	18.00 - 18.45	SPT (S)	N=2 (1,1/0,1,0,1)
					18.00 - 18.45	B + D	
		19.50		Medium dense dark grey locally grey slightly silty slightly gravelly SAND. Sand is fine to coarse.	19.50 - 19.95	SPT (S)	N=19 (2,3/5,5,4,5)
					19.50 - 19.95	B + D	

Hole Diameter

Depth Base (m)	Diameter (mm)
10.00	250
20.00	200
35.00	150

Casing Depths

Depth Base (m)	Diameter (mm)
10.00	250
19.50	200
34.50	150

General Remarks

1.2m Hand excavated inspection pit dug.
Groundwater encountered at 6.40m.
Soakaway in borehole.
Standpipe installed on completion.

Chiselling

From (m)	To (m)	Time (hr)

Ground Water

Depth Strike (m)	Depth Casing (m)	Depth Sealed (m)	Time Elapsed (min)	Water Level (m)
6.40	6.40			

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Borehole Log

Scale 1:100 Sheet 2 of 2

BH-SP07

Contract no:	S230503	**Site:**	Spit Boreholes - Ardersier Port, Inverness	**Driller:**	Bainbridge Brothers Ltd
				Plant used:	Dando 2000
				Started:	20/06/2023
Client:	Ardersier Port			**Ended:**	29/06/2023
Method:	Cable Percussive			**Backfilled:**	29/06/2023

GL (AOD):	
Easting:	280420
Northing:	858666
Logged:	SM
Status:	FINAL

Backfill / Installation	Legend	Depth (m)	Level (m AOD)	Stratum Description	Samples and Insitu Testing		
					Depth (m)	Type	Results
				Medium dense dark grey locally grey slightly silty slightly gravelly SAND. Sand is fine to coarse. Gravel is fine to coarse subangular to well rounded of mixed lithologies including sandstone, mudstone and limestone. Rare shell fragments noted. Frequent fine to coarse coal gravels noted.	21.00 - 21.45 21.00 - 21.45	SPT (S) B + D	N=20 (3,4/4,5,6,5)
					22.50 - 22.95 22.50 - 22.95	SPT (S) B + D	N=24 (5,4/5,6,6,7)
					24.00 - 24.45	U	82 blows [NR]
					24.50 - 24.95 24.50 - 24.95	SPT (S) B + D	N=25 (4,5/6,6,7,6)
		25.50		Medium dense dark grey locally grey silty slightly gravelly SAND. Sand is fine to coarse. Gravel is fine to coarse subangular to well rounded of mixed lithologies including sandstone, mudstone and limestone. Rare shell fragments noted. Frequent fine to coarse coal gravels noted.	25.50 - 25.95 25.50 - 25.95	SPT (S) B + D	N=22 (4,5/5,6,5,6)
					27.00 - 27.45 27.00 - 27.45	SPT (S) B + D	N=24 (5,6/6,6,5,7)
					28.50 - 28.95 28.50 - 28.95	SPT (S) B + D	N=28 (6,5/7,6,7,8)
		30.00		Dense dark grey locally grey slightly silty slightly gravelly SAND. Sand is fine to coarse. Gravel is fine to coarse subangular to well rounded of mixed lithologies including sandstone, mudstone and limestone. Rare shell fragments noted. Frequent fine to coarse coal gravels noted.	30.00 - 30.45 30.00 - 30.45	SPT (S) B + D	N=30 (6,4/7,6,7,10)
					31.50 - 31.95 31.50 - 31.95	SPT (S) B + D	N=42 (6,7/9,10,12,11)
					33.00 - 33.45 33.00 - 33.45	SPT (S) B + D	N=41 (5,6/8,9,11,13)
					34.50 - 34.95 34.50 - 34.95	SPT (S) B + D	N=38 (5,7/7,8,11,12)
		35.00		End of Borehole at 35.000m			

Hole Diameter

Depth Base (m)	Diameter (mm)
10.00	250
20.00	200
35.00	150

Casing Depths

Depth Base (m)	Diameter (mm)
10.00	250
19.50	200
34.50	150

General Remarks

1.2m Hand excavated inspection pit dug.
Groundwater encountered at 6.40m.
Soakaway in borehole.
Standpipe installed on completion.

Chiselling

From (m)	To (m)	Time (hr)

Ground Water

Depth Strike (m)	Depth Casing (m)	Depth Sealed (m)	Time Elapsed (min)	Water Level (m)
6.40	6.40			

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Borehole Log

Scale 1:100 Sheet 1 of 2

BH-SP08

Contract no:	S230503	**Site:**	Spit Boreholes - Ardersier Port, Inverness	**Driller:**	Bainbridge Brothers Ltd
				Plant used:	Dando 2000
				Started:	06/06/2023
Client:	Ardersier Port			**Ended:**	15/06/2023
Method:	Cable Percussive			**Backfilled:**	15/06/2023

GL (AOD):	
Easting:	280219
Northing:	858743
Logged:	SM
Status:	FINAL

Backfill / Installation	Legend	Depth (m)	Level (m AOD)	Stratum Description	Samples and Insitu Testing		
					Depth (m)	Type	Results
				Medium dense light brown very sandy GRAVEL. Sand is fine to coarse. Gravel is fine to coarse subangular to well rounded of mixed lithologies including sandstone, mudstone and limestone. Becoming silty below 2.00m.	0.30 - 0.40	B	
					0.80 - 0.90	B	
					1.20 - 1.65	SPT (S)	N=20 (4,9/6,5,5,4)
					1.20 - 1.65	B+D	
					2.00 - 2.45	SPT (S)	N=16 (2,3/2,5,4,5)
		2.40			2.00 - 2.45	B+D	
				Medium dense light brown slightly silty slightly gravelly SAND. Sand is fine to coarse. Gravel is fine to coarse subangular to well rounded of mixed lithologies including sandstone, mudstone and limestone. Dense at 10.00m.	3.00 - 3.45	SPT (S)	N=15 (1,1/1,2,5,7)
					3.00 - 3.45	B+D	
					4.00 - 4.45	SPT (S)	N=22 (3,4/5,5,5,7)
					4.00 - 4.45	B+D	
					5.00 - 5.45	SPT (S)	N=27 (3,5/6,6,7,8)
					5.00 - 5.45	B+D	
					6.00 - 6.45	SPT (S)	N=29 (1,4/7,7,6,9)
					6.00 - 6.45	B+D	
					7.00 - 7.45	SPT (S)	N=18 (1,3/2,5,5,6)
					7.00 - 7.45	B+D	
					8.00 - 8.45	SPT (S)	N=29 (4,5/6,5,9,9)
					8.00 - 8.45	B+D	
					9.00 - 9.45	SPT (S)	N=29 (2,4/4,7,8,10)
					9.00 - 9.45	B+D	
					10.00 - 10.45	SPT (S)	N=36 (5,5/8,9,10,9)
					10.00 - 10.45	B+D	
					10.50 - 10.95	SPT (S)	N=18 (3,4/4,5,4,5)
					10.50 - 10.95	B+D	
		11.80		Medium dense light grey locally brown slightly silty SAND. Sand is fine to coarse. Gravelly at 13.50m.	11.80 - 11.90	B	
					12.00 - 12.45	SPT (S)	N=20 (4,3/4,5,5,6)
					12.00 - 12.45	B + D	
					13.50 - 13.95	SPT (S)	N=22 (4,4/5,6,5,6)
					13.50 - 13.95	B + D	
					15.00 - 15.45	SPT (S)	N=20 (5,4/5,5,4,6)
					15.00 - 15.45	B + D	
					16.50 - 16.95	SPT (S)	N=25 (4,5/6,6,6,7)
					16.50 - 16.95	B + D	
					18.00 - 18.45	SPT (S)	N=21 (5,6/4,5,6,6)
					18.00 - 18.45	B + D	
		19.50		Medium dense grey slightly silty slightly to very gravelly SAND. Sand is fine to coarse. Gravel is	19.50 - 19.95	SPT (S)	N=21 (6,7/4,6,5,6)
					19.50	B + D	

Hole Diameter

Depth Base (m)	Diameter (mm)
10.00	250
21.00	200
40.00	150

Casing Depths

Depth Base (m)	Diameter (mm)
10.00	250
21.00	200
40.00	150

General Remarks

1.2m Hand Excavated inspection pit dug..
Groundwater encountered at 3.10m.
Soakaway in borehole.
Standpipe installed on completion.

Chiselling

From (m)	To (m)	Time (hr)

Ground Water

Depth Strike (m)	Depth Casing (m)	Depth Sealed (m)	Time Elapsed (min)	Water Level (m)
3.10	3.00			

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Borehole Log

Scale 1:100 Sheet 2 of 2

BH-SP08

Contract no:	S230503	**Site:**	Spit Boreholes - Ardersier Port, Inverness	**Driller:**	Bainbridge Brothers Ltd
				Plant used:	Dando 2000
				Started:	06/06/2023
Client:	Ardersier Port			**Ended:**	15/06/2023
Method:	Cable Percussive			**Backfilled:**	15/06/2023

GL (AOD):		
Easting:	280219	
Northing:	858743	
Logged:	SM	
Status:	FINAL	

Backfill / Installation	Legend	Depth (m)	Level (m AOD)	Stratum Description	Samples and Insitu Testing		
					Depth (m)	Type	Results
				Medium dense grey slightly silty slightly to very gravelly SAND. Sand is fine to coarse. Gravel is fine to coarse subrounded to rounded of sandstone.	21.00 - 21.45	SPT (S)	N=27 (6,6/7,6,7,7)
					21.00 - 21.45	B + D	
					22.50 - 22.95	SPT (S)	N=26 (6,6/7,5,7,7)
					22.50 - 22.95	B + D	
		23.50		Medium dense to dense light grey slightly silty very sandy GRAVEL. Sand is fine to coarse. Gravel is fine to coarse subrounded to rounded of sandstone.	24.00 - 24.45	SPT (S)	N=29 (5,6/6,7,8,8)
					24.00 - 24.45	B + D	
					25.50 - 25.95	SPT (S)	N=32 (6,7/8,7,8,9)
					25.50 - 25.95	B + D	
		27.00		Dense light grey locally brown slightly silty to silty SAND. Sand is fine to coarse.	27.00 - 27.45	SPT (S)	N=35 (6,7/8,9,10,8)
					27.00 - 27.45	B + D	
					28.50 - 28.95	SPT (S)	N=32 (6,7/8,7,8,9)
					28.50 - 28.95	B + D	
					30.00 - 30.45	SPT (S)	N=33 (3,6/8,8,8,9)
					30.00 - 30.45	B+D	
					31.50 - 31.95	SPT (S)	N=39 (7,8/9,9,10,11)
					31.50 - 31.95	B + D	
					33.00 - 33.45	SPT (S)	N=36 (7,8/8,8,9,11)
					33.00 - 33.45	B + D	
					34.50 - 34.95	SPT (S)	N=37 (7,6/7,8,10,12)
					34.50 - 34.95	B + D	
					36.00 - 36.45	SPT (S)	N=38 (7,6/8,8,11,11)
					36.00 - 36.45	B + D	
					37.50 - 37.95	SPT (S)	N=35 (9,6/7,8,9,11)
					37.50 - 37.95	B + D	
					39.00 - 39.45	SPT (S)	N=45
					39.00 - 39.45	B + D	(6,7/10,11,11,13)
		40.00		End of Borehole at 40.000m			

Hole Diameter

Depth Base (m)	Diameter (mm)
10.00	250
21.00	200
40.00	150

Casing Depths

Depth Base (m)	Diameter (mm)
10.00	250
21.00	200
40.00	150

General Remarks

1.2m Hand Excavated inspection pit dug..
Groundwater encountered at 3.10m.
Soakaway in borehole.
Standpipe installed on completion.

Chiselling

From (m)	To (m)	Time (hr)

Ground Water

Depth Strike (m)	Depth Casing (m)	Depth Sealed (m)	Time Elapsed (min)	Water Level (m)
3.10	3.00			

SOLMEK
12-16 Yarm Road
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Borehole Log

Scale 1:100 Sheet 1 of 2

BH-SP09

Contract no:	S230503	**Site:**	Spit Boreholes - Ardersier Port, Inverness	**Driller:**	Bainbridge Brothers Ltd
Client:	Ardersier Port			**Plant used:**	Dando 2000
Method:	Cable Percussive			**Started:**	23/05/2023
				Ended:	26/05/2023
				Backfilled:	26/05/2023

GL (AOD):	
Easting:	280060
Northing:	858762
Logged:	SM
Status:	FINAL

Backfill / Installation	Legend	Depth (m)	Level (m AOD)	Stratum Description	Samples and Insitu Testing		
					Depth (m)	Type	Results
				Medium dense to dense light brown to grey slightly silty very sandy GRAVEL. Sand is fine to coarse. Gravel is fine to coarse subangular to very well rounded of mixed lithologies including sandstone, mudstone and limestone.	0.50 - 0.60	B	
					1.00 - 1.45	SPT (S)	N=25 (9,8/7,6,6,6)
					1.00 - 1.45	B + D	
					2.00 - 2.45	SPT (S)	N=23 (4,6/7,5,5,6)
					2.00 - 2.45	B + D	
					3.00 - 3.45	SPT (S)	N=45 (3,5/6,7,20,12)
					3.00 - 3.45	B + D	
					4.00 - 4.45	SPT (S)	N=14 (4,4/3,3,4,4)
					4.00 - 4.45	B + D	
				Becoming gravelly SAND.			
		5.00		Medium dense to dense light brown slightly silty very gravelly SAND. Sand is fine to coarse. Gravel is fine to coarse subangular to very well rounded of mixed lithologies including sandstone, mudstone and limestone. Gravel at 8.00m.	5.00 - 5.45	SPT (S)	N=23 (2,2/3,4,6,10)
					5.00 - 5.45	B + D	
					6.00 - 6.45	SPT (S)	N=24 (1,3/2,6,8,8)
					6.00 - 6.45	B + D	
					7.00 - 7.45	SPT (S)	N=24 (6,6/5,7,6,6)
					7.00 - 7.45	B + D	
					8.00 - 8.45	SPT (S)	N=29 (6,7/7,7,8,7)
					8.00 - 8.45	B + D	
					9.00 - 9.45	SPT (S)	N=33 (6,8/8,9,9,7)
					9.00 - 9.45	B + D	
		10.50		Medium dense dark grey and locally black slightly silty to silty slightly gravelly SAND. Sand is fine to coarse. Gravel is fine to coarse subangular to well rounded of mixed lithologies including sandstone, mudstone and limestone. Occasional fine to coarse shell fragments noted throughout.	10.50 - 10.95	SPT (S)	N=15 (2,4/4,4,4,3)
					10.50 - 10.95	B + D	
					12.00 - 12.45	SPT (S)	N=12 (2,2/3,3,2,4)
					12.00 - 12.45	B + D	
					13.50 - 13.95	SPT (S)	N=12 (3,3/3,2,3,4)
					13.50 - 13.95	B + D	
					15.00 - 15.45	SPT (S)	N=18 (4,4/4,5,4,5)
					15.00 - 15.45	B + D	
					16.50 - 16.95	SPT (S)	N=21 (4,5/5,5,6,5)
					16.50 - 16.95	B + D	
					18.00 - 18.45	SPT (S)	N=22 (5,5/5,6,6,5)
					18.00 - 18.45	B + D	
					19.50 - 19.95	SPT (S)	N=22 (6,6/6,5,6,5)
					19.50 - 19.95	B + D	

Hole Diameter

Depth Base (m)	Diameter (mm)
10.00	250
21.00	200
35.00	150

Casing Depths

Depth Base (m)	Diameter (mm)
10.00	250
21.00	200
35.00	150

General Remarks

1.2m Hand Excavated inspection pit dug.
Groundwater encountered at 3.20m.
Borehole backfilled on completion.

Chiselling

From (m)	To (m)	Time (hr)

Ground Water

Depth Strike (m)	Depth Casing (m)	Depth Sealed (m)	Time Elapsed (min)	Water Level (m)
3.20	3.00			

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Borehole Log

Scale 1:100 Sheet 2 of 2

BH-SP09

Contract no:	S230503	**Site:**	Spit Boreholes - Ardersier Port, Inverness	**Driller:**	Bainbridge Brothers Ltd
				Plant used:	Dando 2000
				Started:	23/05/2023
Client:	Ardersier Port			**Ended:**	26/05/2023
Method:	Cable Percussive			**Backfilled:**	26/05/2023

GL (AOD):	
Easting:	280060
Northing:	858762
Logged:	SM
Status:	FINAL

Backfill / Installation	Legend	Depth (m)	Level (m AOD)	Stratum Description	Samples and Insitu Testing		
					Depth (m)	Type	Results
				Medium dense dark grey and locally black slightly silty to silty slightly gravelly SAND. Sand is fine to coarse. Gravel is fine to coarse subangular to well rounded of mixed lithologies including sandstone, mudstone and limestone. Occasional fine to coarse shell fragments noted throughout.	21.00 - 21.45	SPT (S)	N=23 (6,6/5,6,6,6)
					21.00 - 21.45	B + D	
					22.50 - 22.95	SPT (S)	N=25 (7,6/6,6,7,6)
					22.50 - 22.95	B + D	
					23.00 - 23.45	SPT (S)	N=25 (6,6/5,6,7,7)
					23.00 - 23.45	B + D	
					24.00 - 24.45	SPT (S)	N=29 (7,6/7,7,8,7)
					24.00 - 24.45	B + D	
					25.50 - 25.95	SPT (S)	N=25 (5,6/5,5,7,8)
					25.50 - 25.95	B + D	
					27.00 - 27.45	SPT (S)	N=27 (5,5/6,7,7,7)
					27.00 - 27.45	B + D	
		28.50		Medium dense to dense dark grey and locally black slightly silty to silty slightly gravelly SAND. Sand is fine to coarse. Gravel is fine to coarse subangular to well rounded of mixed lithologies including sandstone, mudstone and limestone. Occasional fine to coarse shell fragments noted throughout.	28.50 - 28.95	SPT (S)	N=33 (6,7/7,8,8,10)
					28.50 - 28.95	B + D	
					30.00 - 30.45	SPT (S)	N=34 (6,7/7,8,8,11)
					30.00 - 30.45	B + D	
					31.50 - 31.95	SPT (S)	N=29 (4,5/5,7,8,9)
					31.50 - 31.95	B + D	
					33.00 - 33.45	SPT (S)	N=38 (5,5/7,8,12,11)
					33.00 - 33.45	B + D	
					34.50 - 34.95	SPT (S)	N=39 (6,5/7,8,11,13)
					34.50 - 34.95	B + D	
		35.00		End of Borehole at 35.000m			

Hole Diameter

Depth Base (m)	Diameter (mm)
10.00	250
21.00	200
35.00	150

Casing Depths

Depth Base (m)	Diameter (mm)
10.00	250
21.00	200
35.00	150

General Remarks

1.2m Hand Excavated inspection pit dug.
Groundwater encountered at 3.20m.
Borehole backfilled on completion.

Chiselling

From (m)	To (m)	Time (hr)

Ground Water

Depth Strike (m)	Depth Casing (m)	Depth Sealed (m)	Time Elapsed (min)	Water Level (m)
3.20	3.00			

APPENDIX C

Laboratory Report Front Sheet

Site name	Job number
Ardersier Port	S230503

G2M Testing (Stockton)
12-16 Yarm Road,
Stockton on Tees,
TS18 3NA
01642 033318
info@g2mtesting.co.uk

UKAS TESTING
10258

Client details:

Reference:	S230503
Name:	Solmek
Address:	12 Yarm Road, Stockton-on-tees, TS18 3NA
Telephone:	01642 607083
Email:	acutts@solmek.com
FAO:	Adrian Cutts

Samples received:

Date commenced: 14/07/2023

Date reported: 21/07/2023

Observations and interpretations are outside of the UKAS Accreditiation

A copy of the Laboratory Schedule of accredited tests as issued by UKAS is attached to this report. This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This certificate shall not be reproduced in full, without the prior written approval of the laboratory.

Samples will be held at the laboratory for a period of 4 weeks after the report date. After the above reporting date the samples will be disposed of. Should further testing be required then the office should be informed before the above date.

Signature:	Approved Signitories:
J Brischuk	☐ D.Anderson (Managing Director) ☑ J. Brischuk (Laboratory Manager) ☐

Summary of Classification Tests

G2M Testing (Stockton)
12-16 Yarm Road,
Stockton on Tees,
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10258

Site name	Job number
Ardersier Port	S230503

Hole	Depth Top m	Depth Base m	Type	*w* %	Oven temp. oc	wa %	Pa %	Pr %	wL %	wP %	IP %	IL	Plasticity class	Preparation method
BHSP05	0.30		B	2.3	105									
BHSP05	1.20		B	1.8	105									
BHSP05	3.00		B	19	105									
BHSP05	5.00		B	21	105									
BHSP05	7.00		B	20	105									
BHSP05	9.00		B	23	105									
BHSP05	12.00		B	25	105									
BHSP05	15.00		B	26	105									
BHSP05	18.00		B	31	105									
BHSP05	21.00		B	22	105									
BHSP05	24.00		B	21	105									
BHSP05	27.00		B	20	105									
BHSP05	30.00		B	20	105									
BHSP05	33.00		B	21	105									
BHSP05	36.00		B	25	105									
BHSP05	39.00		B	22	105									

All tests found in G2M Testing UKAS Schedule of Accreditation are tested to standard unless otherwise indicated

Key	Description		Category	BS Test Code
w	Moisture content			BS 1377:1990 Part 2 Clause 3.2
wa	Equivalent moisture content passing 425µm sieve			BS 1377:1990 Part 2 Clause 3.2
wL	Liquid limit	Single point	-s	BS 1377:1990 Part 2 Clause 4.4
		Four point	-f	BS 1377:1990 Part 2 Clause 4.3
wP	Plastic limit			BS 1377:1990 Part 2 Clause 5.2
Pa	Percentage passing 425um sieve			
Pr	Percentage retained 425um sieve			
IP	Plasticity index			BS 1377:1990 Part 2 Clause 5.4
IL	Liquidity index			BS 1377:1990 Part 2 Clause 5.4
	Suffix indicating test is "Not UKAS Accredited"		*	

Approved by	JBrischuk
Approval date	20/07/2023 15:28
Date report generated	
Report Number	

PARTICLE SIZE DISTRIBUTION

Site name	Job number
Ardersier Port	S230503

G2M Testing (Stockton)
12-16 Yarm Road,
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TS18 3NA
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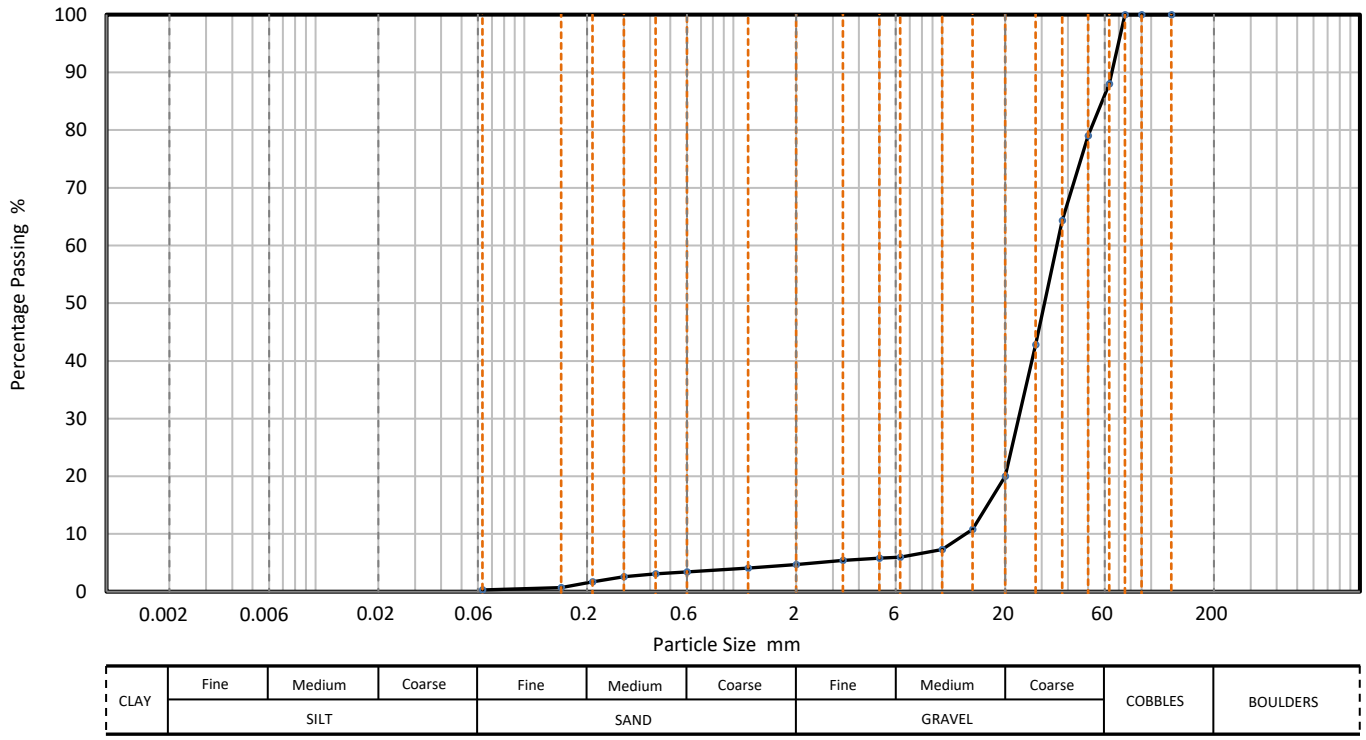
UKAS TESTING
10258

Hole	BHSP05	Lab sample ID	G2MT20230714106
Depth (Top) m	0.30	Test Method	BS 1377 - 2 : 1990 Clause 9.2
Depth (Base) m		Soil Description	Slightly Sandy, Very Gravelly (with Cobbles)
Sample type	B		



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	88		
50	79		
37.5	64		
28	43		
20	20		
14	11		
10	7		
6.3	6		
5	6		
3.35	5		
2	5		
1.18	4		
0.6	3		
0.425	3		
0.3	3		
0.212	2		
0.15	1		
0.063	0		

Dry Mass of sample, g: 8207

Sample Proportions	% dry mass
Very coarse	12.0
Gravel	83.3
Sand	4.4
Fines <0.063mm	0.0

Grading Analysis		
D100	mm	
D60	mm	35.4
D30	mm	23.2
D10	mm	13
Uniformity Coefficient		2.7
Curvature Coefficient		1.2

Remarks

Preparation and testing in accordance with test method unless noted below

Sample tested was deviating in accordance with BS1377 test standard

Accreditation status

Hydrometer is the usual Sedimentation method carried out by G2M Testing and is part of the G2M Testing UKAS accreditation schedule.

Approved by	JBrischuk
Approval date	20/07/2023 16:24

PARTICLE SIZE DISTRIBUTION

Site name	Job number
Ardersier Port	S230503

G2M Testing (Stockton)
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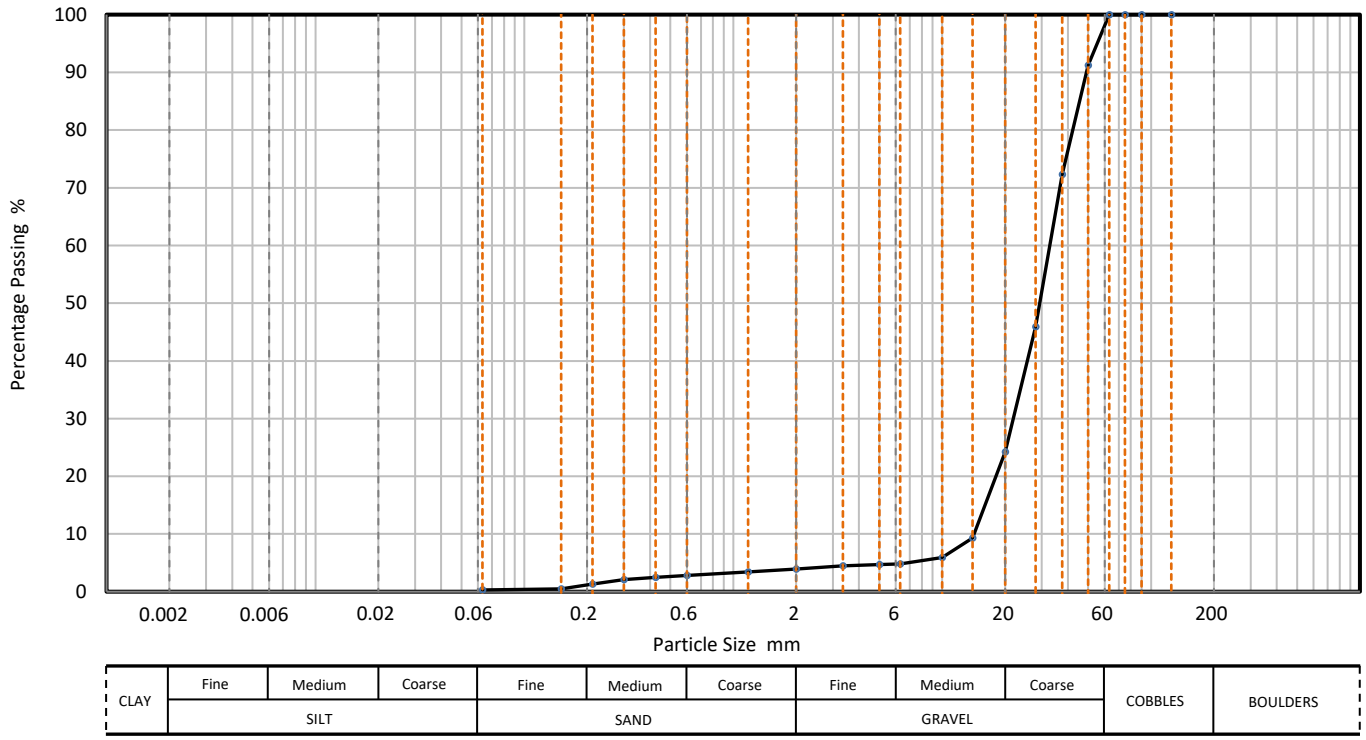
UKAS TESTING
10258

Hole	BHSP05	Lab sample ID	G2MT20230714107
Depth (Top) m	1.20	Test Method	BS 1377 - 2 : 1990 Clause 9.2
Depth (Base) m		Soil Description	Slighlty Sandy GRAVEL
Sample type	B		



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	91		
37.5	72		
28	46		
20	24		
14	9		
10	6		
6.3	5		
5	5		
3.35	5		
2	4		
1.18	3		
0.6	3		
0.425	3		
0.3	2		
0.212	1		
0.15	1		
0.063	0		

Dry Mass of sample, g: 11484

Sample Proportions	% dry mass
Very coarse	0.0
Gravel	96.1
Sand	3.7
Fines <0.063mm	0.0

Grading Analysis		
D100	mm	
D60	mm	32.7
D30	mm	21.9
D10	mm	14.2
Uniformity Coefficient		2.3
Curvature Coefficient		1

Remarks

Preparation and testing in accordance with test method unless noted below

Sample tested was deviating in accordance with BS1377 test standard

Accreditation status

Hydrometer is the usual Sedimentation method carried out by G2M Testing and is part of the G2M Testing UKAS accreditation schedule.

Approved by	JBrischuk
Approval date	20/07/2023 16:24

PARTICLE SIZE DISTRIBUTION

Site name	Job number
Ardersier Port	S230503

G2M Testing (Stockton)
12-16 Yarm Road,
Stockton on Tees,
TS18 3NA
01642 033318
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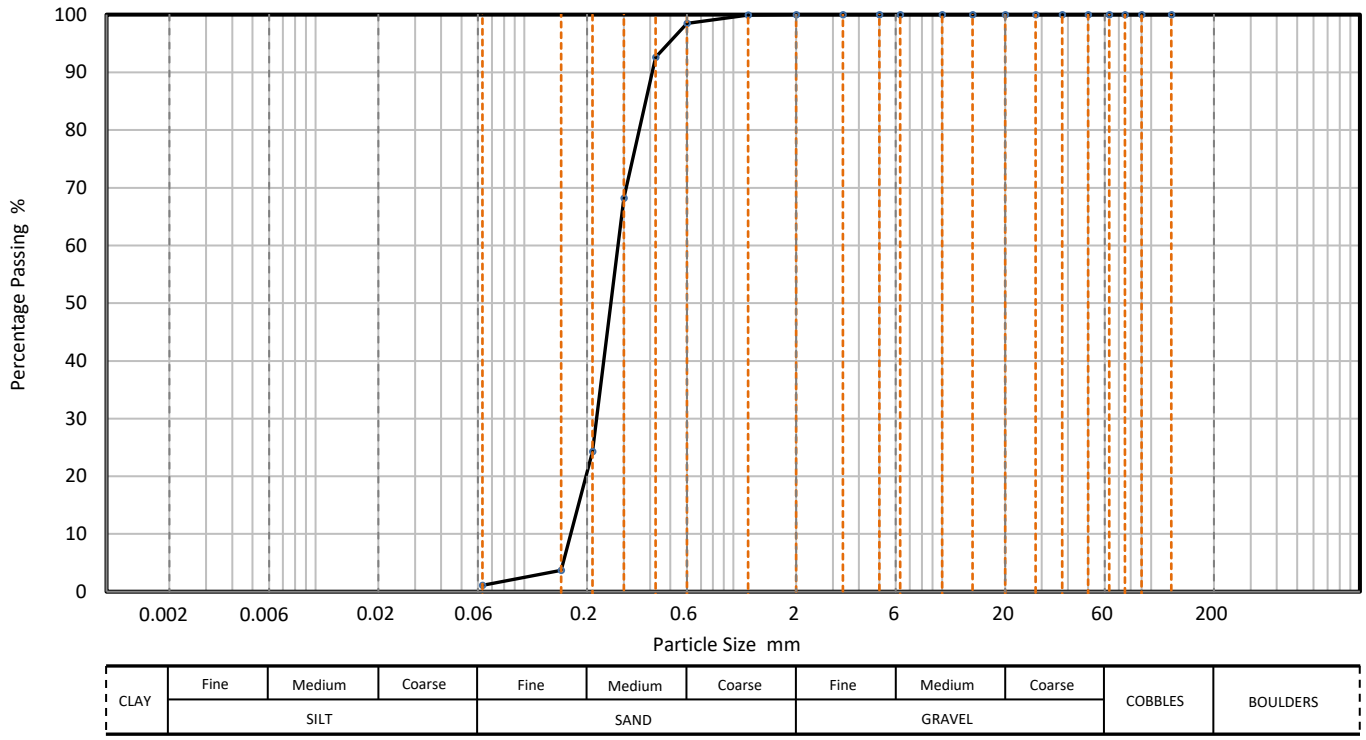
UKAS TESTING
10258

Hole	BHSP05	Lab sample ID	G2MT20230714108
Depth (Top) m	3.00	Test Method	BS 1377 - 2 : 1990 Clause 9.2
Depth (Base) m		Soil Description	Slightly Clayey SAND
Sample type	B		



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	100		
6.3	100		
5	100		
3.35	100		
2	100		
1.18	100		
0.6	99		
0.425	93		
0.3	68		
0.212	24		
0.15	4		
0.063	1		

Dry Mass of sample, g	466

Sample Proportions	% dry mass
Very coarse	0.0
Gravel	0.0
Sand	98.9
Fines <0.063mm	1.0

Grading Analysis		
D100	mm	
D60	mm	0.281
D30	mm	0.222
D10	mm	0.167
Uniformity Coefficient		1.7
Curvature Coefficient		1

Remarks
Preparation and testing in accordance with test method unless noted below

Accreditation status
Hydrometer is the usual Sedimentation method carried out by G2M Testing and is part of the G2M Testing UKAS accreditation schedule.

Approved by	JBrischuk
Approval date	20/07/2023 16:24

PARTICLE SIZE DISTRIBUTION

Site name	Job number
Ardersier Port	S230503

G2M Testing (Stockton)
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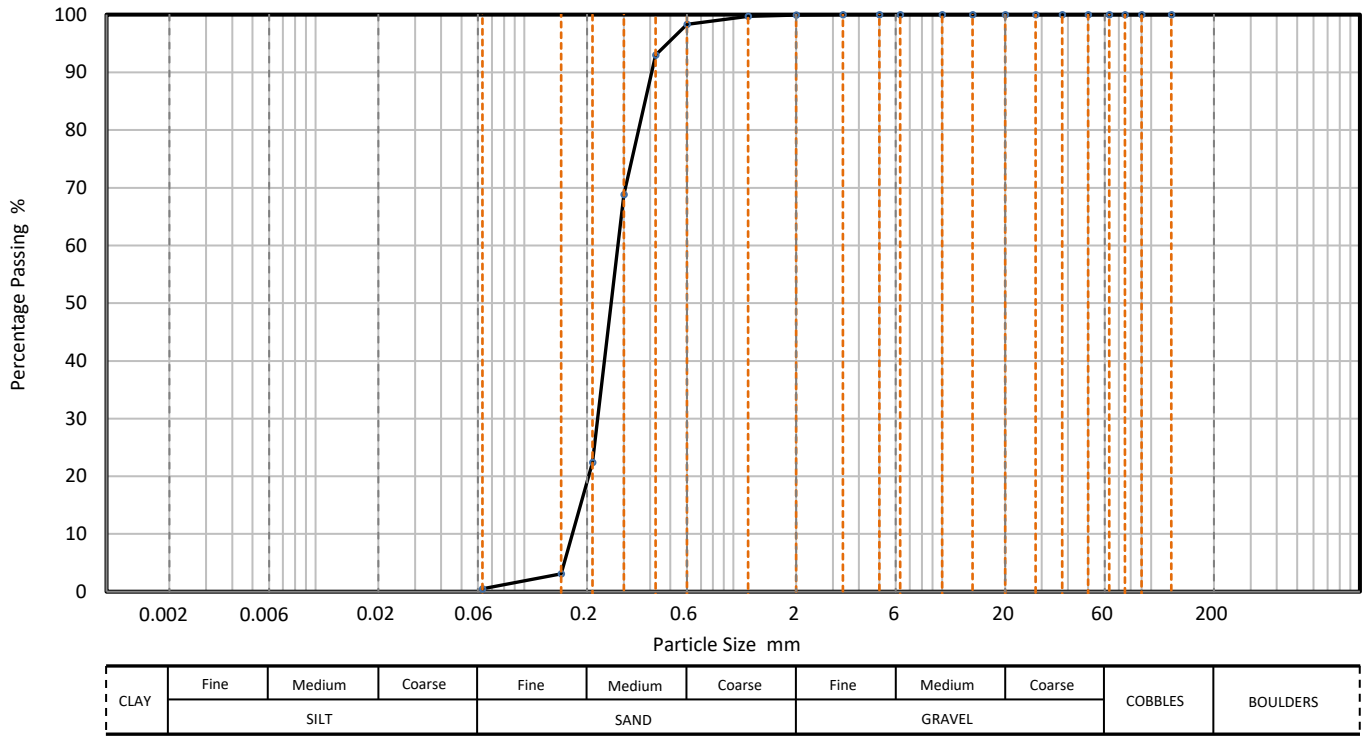
UKAS TESTING
10258

Hole	BHSP05	Lab sample ID	G2MT20230714109
Depth (Top) m	5.00	Test Method	BS 1377 - 2 : 1990 Clause 9.2
Depth (Base) m		Soil Description	Slightly Gravelly, Slightly Clayey SAND
Sample type	B		



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	100		
6.3	100		
5	100		
3.35	100		
2	100		
1.18	100		
0.6	98		
0.425	93		
0.3	69		
0.212	22		
0.15	3		
0.063	1		

Dry Mass of sample, g	521

Sample Proportions	% dry mass
Very coarse	0.0
Gravel	0.1
Sand	99.4
Fines <0.063mm	1.0

Grading Analysis		
D100	mm	
D60	mm	0.281
D30	mm	0.224
D10	mm	0.17
Uniformity Coefficient		1.7
Curvature Coefficient		1.1

Remarks
Preparation and testing in accordance with test method unless noted below

Accreditation status
Hydrometer is the usual Sedimentation method carried out by G2M Testing and is part of the G2M Testing UKAS accreditation schedule.

Approved by	JBrischuk
Approval date	20/07/2023 16:24

PARTICLE SIZE DISTRIBUTION

Site name	Job number
Ardersier Port	S230503

G2M Testing (Stockton)
12-16 Yarm Road,
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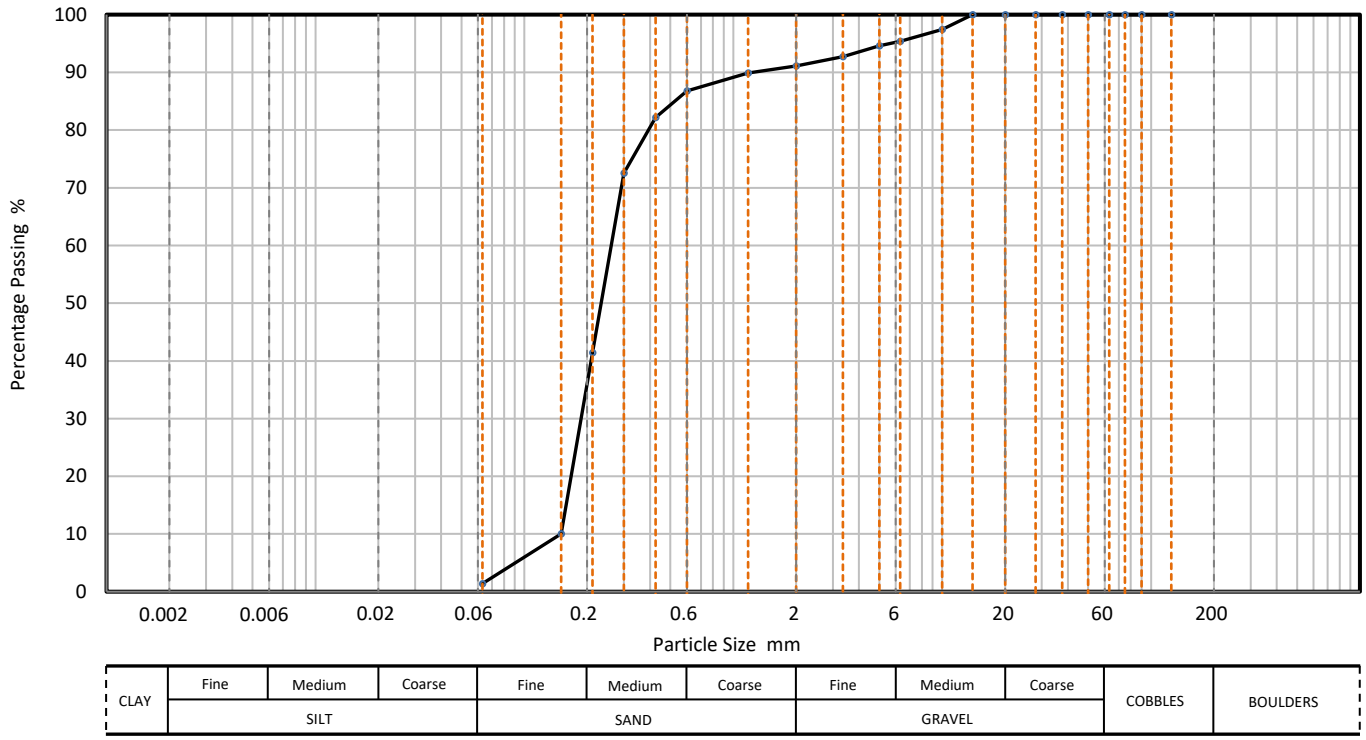
TS18 3NA
01642 033318
info@g2mtesting.co.uk

UKAS TESTING
10258

Hole	BHSP05	Lab sample ID	G2MT20230714110
Depth (Top) m	7.00	Test Method	BS 1377 - 2 : 1990 Clause 9.2
Depth (Base) m		Soil Description	Slightly Clayey, Gravelly SAND
Sample type	B		



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	97		
6.3	95		
5	95		
3.35	93		
2	91		
1.18	90		
0.6	87		
0.425	82		
0.3	73		
0.212	41		
0.15	10		
0.063	1		

Dry Mass of sample, g: 925

Sample Proportions	% dry mass
Very coarse	0.0
Gravel	8.9
Sand	89.7
Fines <0.063mm	1.0

Grading Analysis		
D100	mm	
D60	mm	0.261
D30	mm	0.187
D10	mm	0.15
Uniformity Coefficient		1.7
Curvature Coefficient		0.89

Remarks
Preparation and testing in accordance with test method unless noted below

Accreditation status
Hydrometer is the usual Sedimentation method carried out by G2M Testing and is part of the G2M Testing UKAS accreditation schedule.

Approved by	JBrischuk
Approval date	20/07/2023 16:24

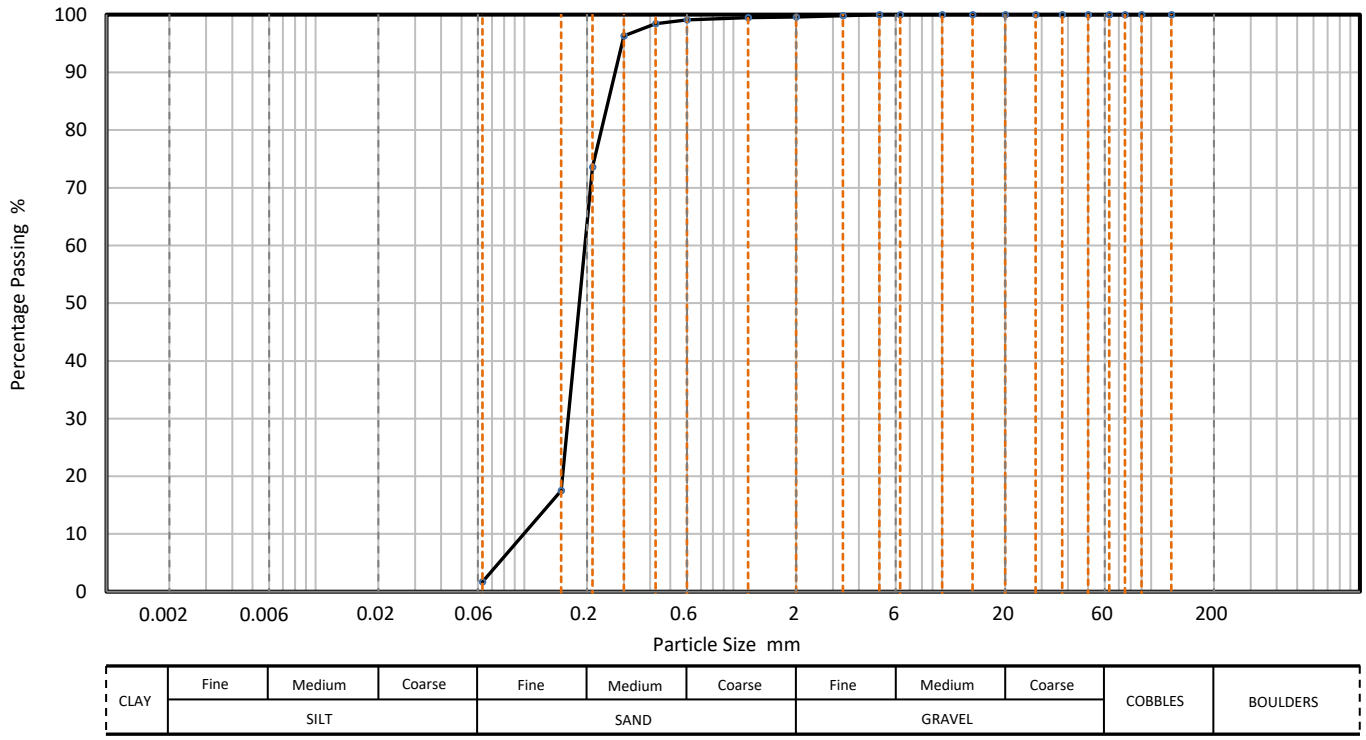
PARTICLE SIZE DISTRIBUTION

Site name	Job number
Ardersier Port	S230503

G2M Testing (Stockton)
12-16 Yarm Road,
Stockton on Tees,
TS18 3NA
01642 033318
info@g2mtesting.co.uk

UKAS TESTING
10258

Hole	BHSP05	Lab sample ID	G2MT20230714111
Depth (Top) m	9.00	Test Method	BS 1377 - 2 : 1990 Clause 9.2
Depth (Base) m		Soil Description	Slightly Gravelly, Slightly Clayey SAND
Sample type	B		



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	100		
6.3	100		
5	100		
3.35	100		
2	100		
1.18	100		
0.6	99		
0.425	98		
0.3	96		
0.212	74		
0.15	18		
0.063	2		

Dry Mass of sample, g	952

Sample Proportions	% dry mass
Very coarse	0.0
Gravel	0.4
Sand	98.0
Fines <0.063mm	2.0

Grading Analysis		
D100	mm	
D60	mm	0.195
D30	mm	0.162
D10	mm	0.0995
Uniformity Coefficient		2
Curvature Coefficient		1.4

Remarks
Preparation and testing in accordance with test method unless noted below

Accreditation status
Hydrometer is the usual Sedimentation method carried out by G2M Testing and is part of the G2M Testing UKAS accreditation schedule.

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Approval date	20/07/2023 16:24

PARTICLE SIZE DISTRIBUTION

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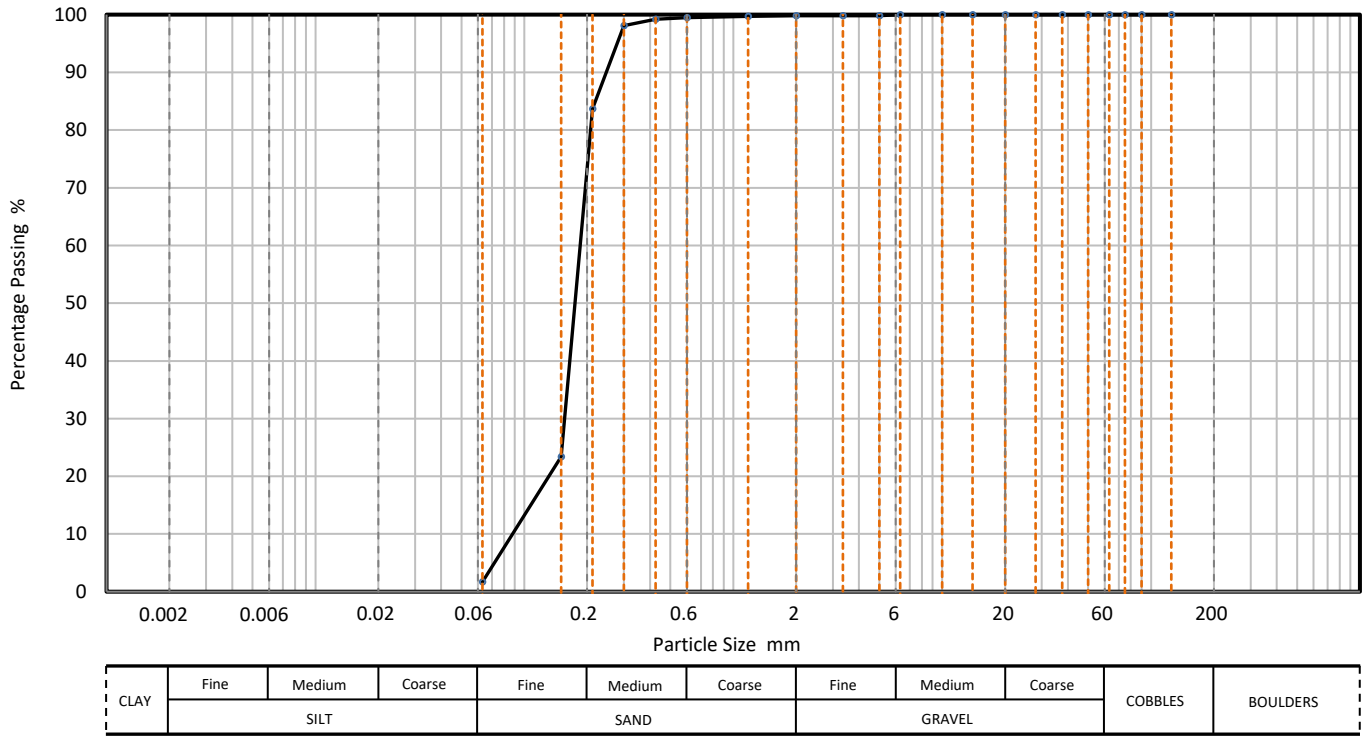
Hole		BHSP05	Lab sample ID	G2MT20230714112
Depth (Top)	m	12.00	Test Method	BS 1377 - 2 : 1990 Clause 9.2
Depth (Base)	m		Soil Description	Slightly Gravelly, Slightly Clayey SAND
Sample type		B		



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	100		
6.3	100		
5	100		
3.35	100		
2	100		
1.18	100		
0.6	100		
0.425	99		
0.3	98		
0.212	84		
0.15	23		
0.063	2		

Dry Mass of sample, g	446

Sample Proportions	% dry mass
Very coarse	0.0
Gravel	0.2
Sand	98.0
Fines <0.063mm	2.0

Grading Analysis		
D100	mm	
D60	mm	0.185
D30	mm	0.156
D10	mm	0.0877
Uniformity Coefficient		2.1
Curvature Coefficient		1.5

Remarks
Preparation and testing in accordance with test method unless noted below

Accreditation status
Hydrometer is the usual Sedimentation method carried out by G2M Testing and is part of the G2M Testing UKAS accreditation schedule.

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Approval date	20/07/2023 16:24

PARTICLE SIZE DISTRIBUTION

Site name	Job number
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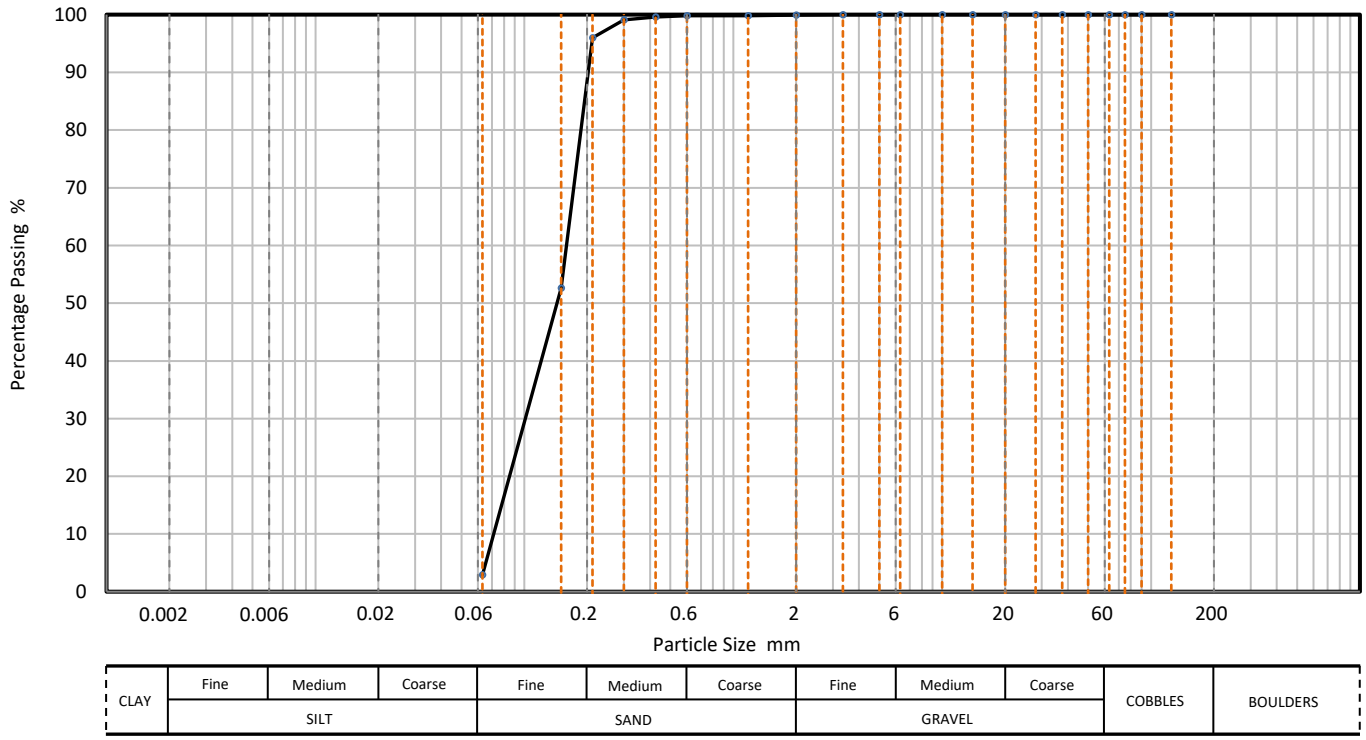
Hole	BHSP05	Lab sample ID	G2MT20230714113
Depth (Top) m	15.00	Test Method	BS 1377 - 2 : 1990 Clause 9.2
Depth (Base) m		Soil Description	Slightly Gravelly, Slightly Clayey, SAND
Sample type	B		



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	100		
6.3	100		
5	100		
3.35	100		
2	100		
1.18	100		
0.6	100		
0.425	100		
0.3	99		
0.212	96		
0.15	53		
0.063	3		

Dry Mass of sample, g	440

Sample Proportions	% dry mass
Very coarse	0.0
Gravel	0.1
Sand	97.0
Fines <0.063mm	3.0

Grading Analysis		
D100	mm	
D60	mm	0.159
D30	mm	0.101
D10	mm	0.0713
Uniformity Coefficient		2.2
Curvature Coefficient		0.9

Remarks
Preparation and testing in accordance with test method unless noted below

Accreditation status
Hydrometer is the usual Sedimentation method carried out by G2M Testing and is part of the G2M Testing UKAS accreditation schedule.

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Approval date	20/07/2023 16:24

PARTICLE SIZE DISTRIBUTION

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Ardersier Port	S230503

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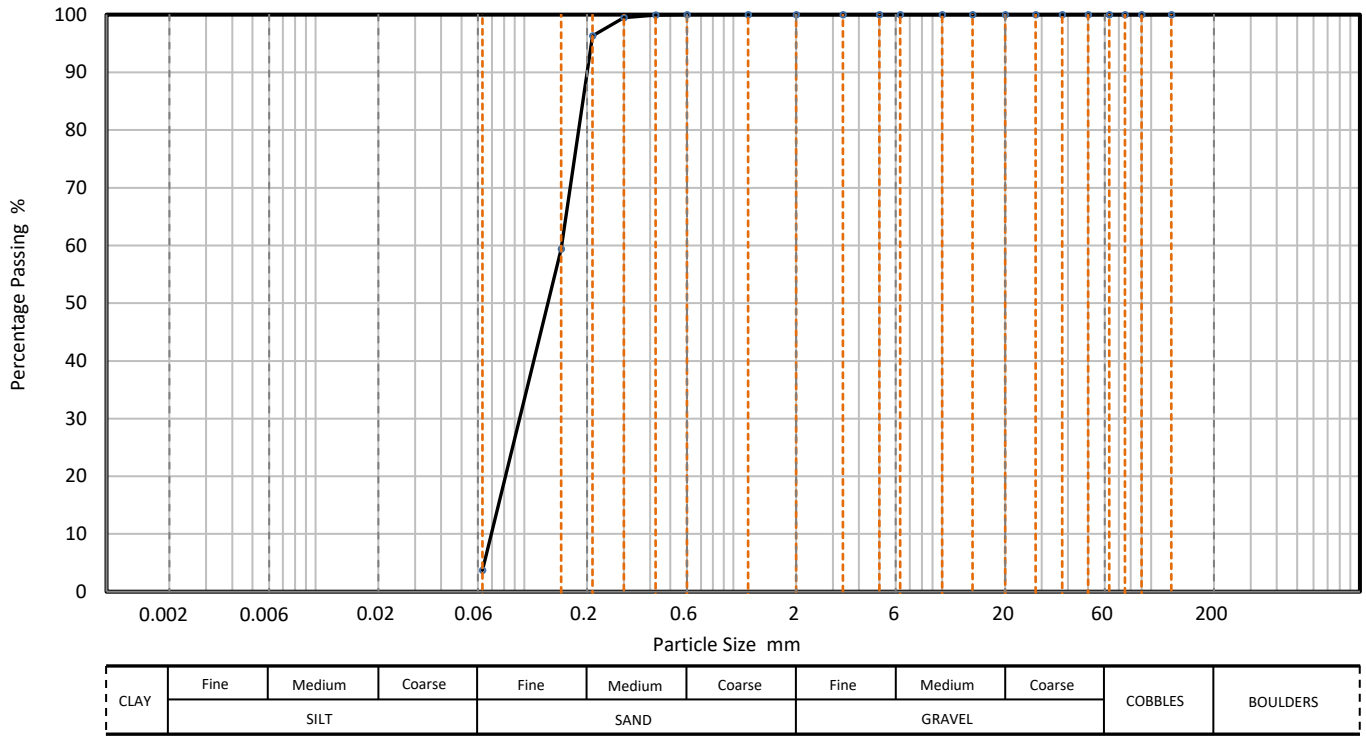
Hole	BHSP05	Lab sample ID	G2MT20230714114
Depth (Top) m	18.00	Test Method	BS 1377 - 2 : 1990 Clause 9.2
Depth (Base) m		Soil Description	Slightly Clayey, SAND
Sample type	B		



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	100		
6.3	100		
5	100		
3.35	100		
2	100		
1.18	100		
0.6	100		
0.425	100		
0.3	100		
0.212	96		
0.15	59		
0.063	4		

Dry Mass of sample, g: 516

Sample Proportions	% dry mass
Very coarse	0.0
Gravel	0.0
Sand	96.3
Fines <0.063mm	4.0

Grading Analysis		
D100	mm	
D60	mm	0.151
D30	mm	0.0949
D10	mm	0.0695
Uniformity Coefficient		2.2
Curvature Coefficient		0.86

Remarks
Preparation and testing in accordance with test method unless noted below

Accreditation status
Hydrometer is the usual Sedimentation method carried out by G2M Testing and is part of the G2M Testing UKAS accreditation schedule.

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Approval date	20/07/2023 16:24

PARTICLE SIZE DISTRIBUTION

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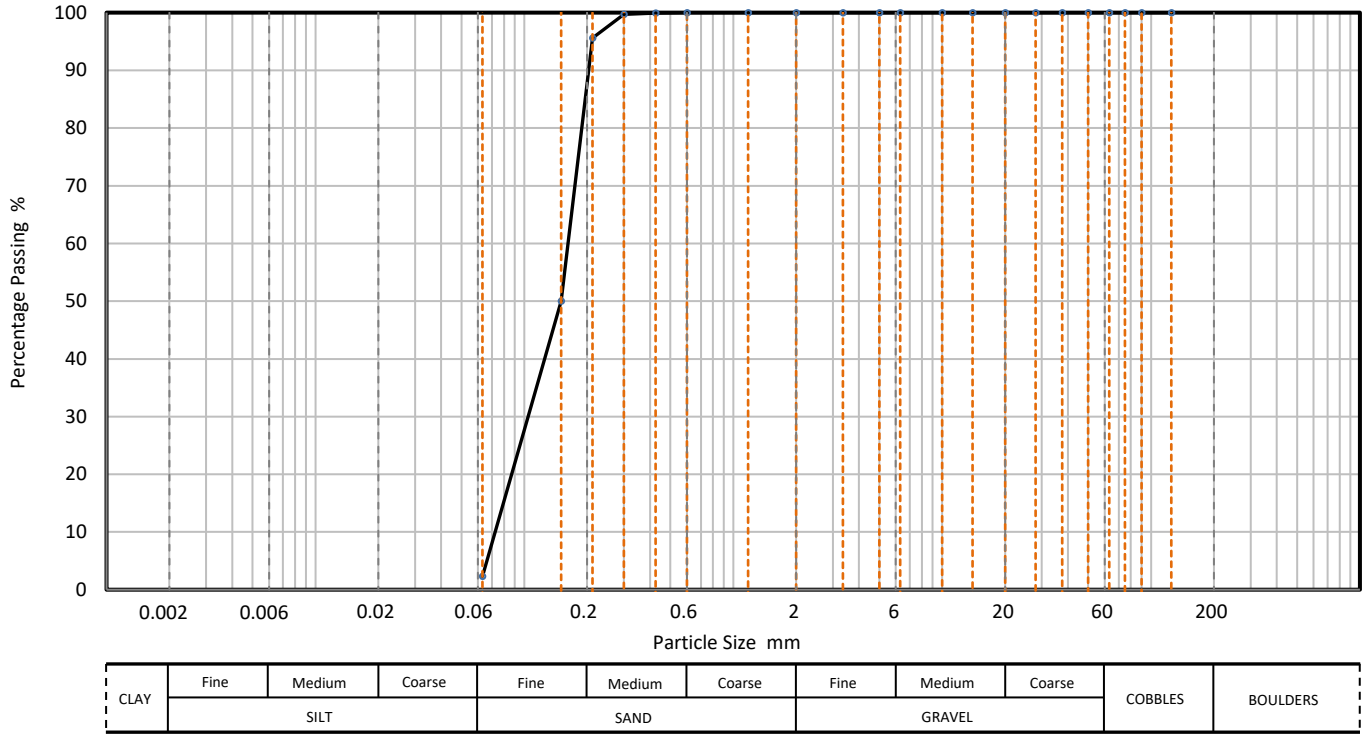
Hole		BHSP05	Lab sample ID	G2MT20230714115
Depth (Top)	m	21.00	Test Method	BS 1377 - 2 : 1990 Clause 9.2
Depth (Base)	m		Soil Description	Slightly Clayey SAND
Sample type		B		



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	100		
6.3	100		
5	100		
3.35	100		
2	100		
1.18	100		
0.6	100		
0.425	100		
0.3	100		
0.212	96		
0.15	50		
0.063	2		

Dry Mass of sample, g	477

Sample Proportions	% dry mass
Very coarse	0.0
Gravel	0.0
Sand	97.7
Fines <0.063mm	2.0

Grading Analysis		
D100	mm	
D60	mm	0.162
D30	mm	0.104
D10	mm	0.0725
Uniformity Coefficient		2.2
Curvature Coefficient		0.93

Remarks
Preparation and testing in accordance with test method unless noted below

Accreditation status
Hydrometer is the usual Sedimentation method carried out by G2M Testing and is part of the G2M Testing UKAS accreditation schedule.

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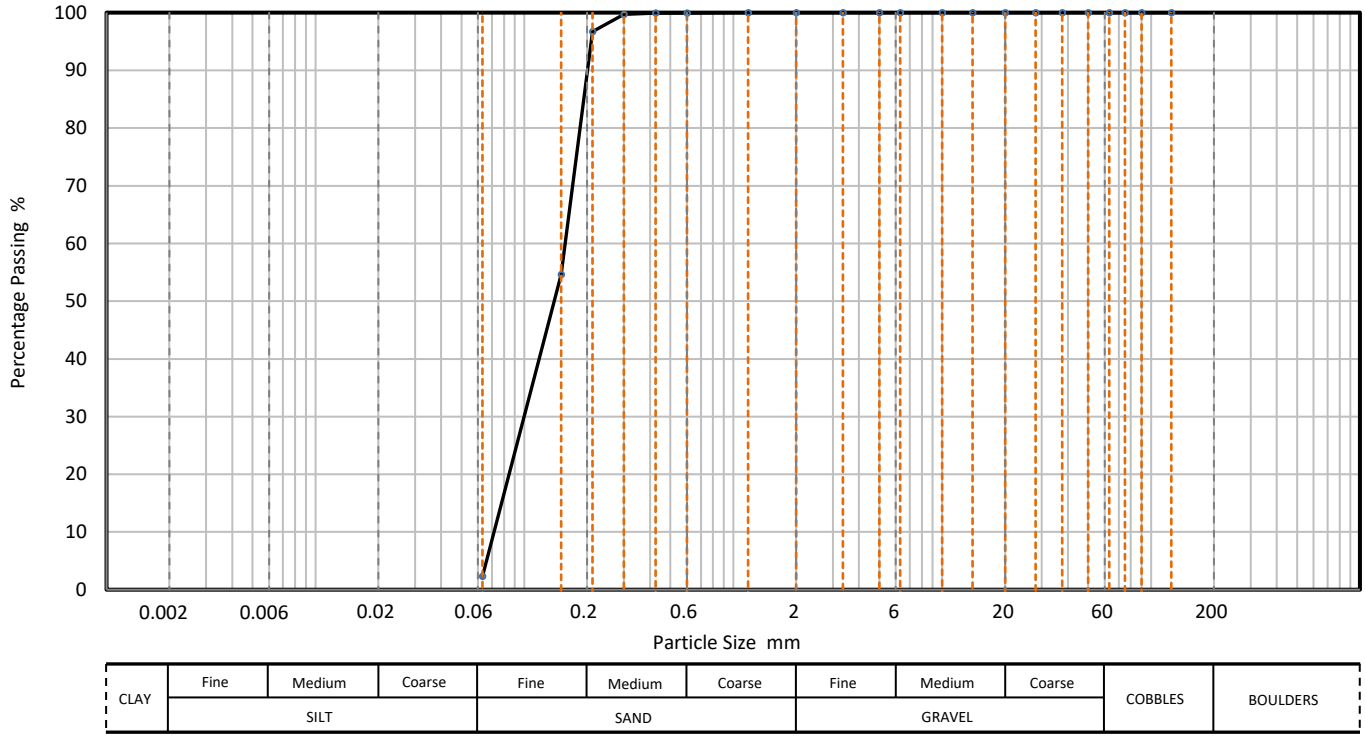
Hole	BHSP05	Lab sample ID	G2MT20230714116
Depth (Top) m	24.00	Test Method	BS 1377 - 2 : 1990 Clause 9.2
Depth (Base) m		Soil Description	Slightly Clayey, SAND
Sample type	B		



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	100		
6.3	100		
5	100		
3.35	100		
2	100		
1.18	100		
0.6	100		
0.425	100		
0.3	100		
0.212	97		
0.15	55		
0.063	2		

Dry Mass of sample, g	461

Sample Proportions	% dry mass
Very coarse	0.0
Gravel	0.0
Sand	97.7
Fines <0.063mm	2.0

Grading Analysis		
D100	mm	
D60	mm	0.157
D30	mm	0.0997
D10	mm	0.0716
Uniformity Coefficient		2.2
Curvature Coefficient		0.89

Remarks
Preparation and testing in accordance with test method unless noted below

Accreditation status
Hydrometer is the usual Sedimentation method carried out by G2M Testing and is part of the G2M Testing UKAS accreditation schedule.

Approved by	JBrischuk
Approval date	20/07/2023 16:24

PARTICLE SIZE DISTRIBUTION

Site name	Job number
Ardersier Port	S230503

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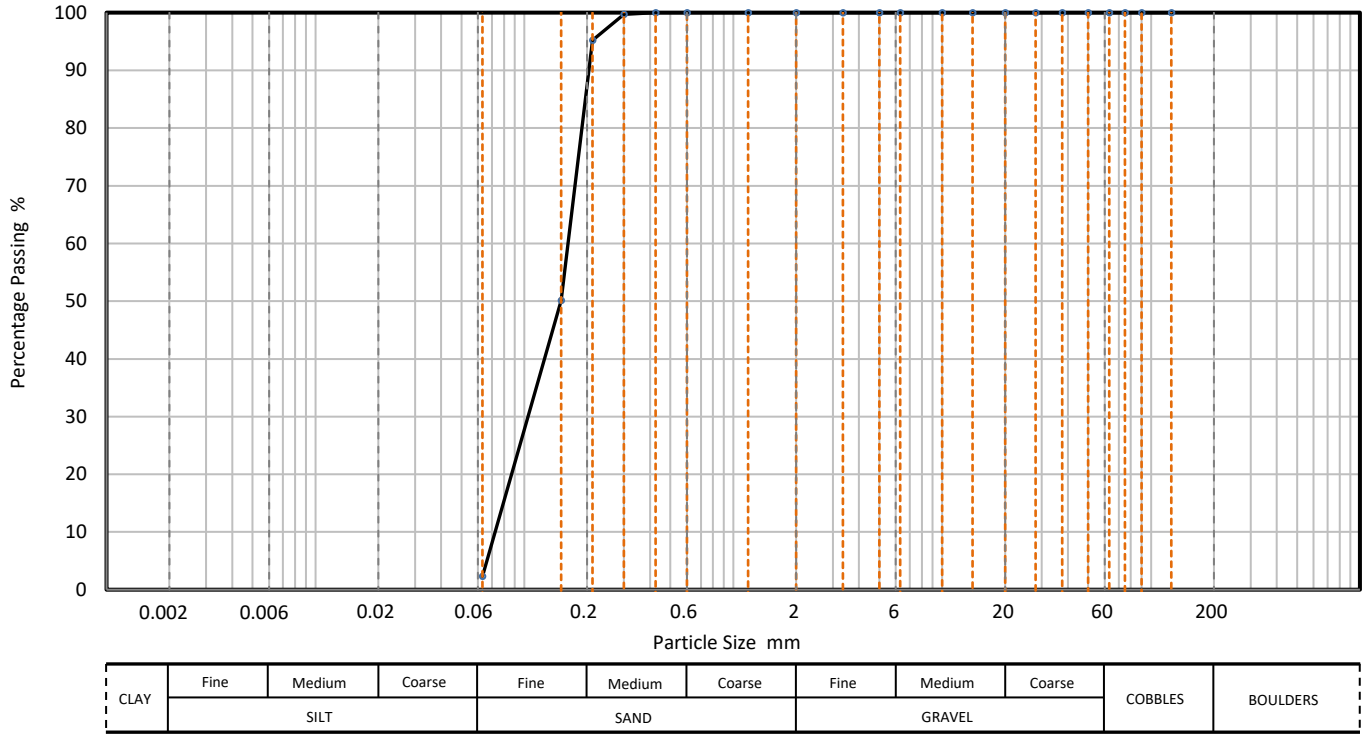
Hole	BHSP05	Lab sample ID	G2MT20230714117
Depth (Top) m	27.00	Test Method	BS 1377 - 2 : 1990 Clause 9.2
Depth (Base) m		Soil Description	Slightly Clayey, SAND
Sample type	B		



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	100		
6.3	100		
5	100		
3.35	100		
2	100		
1.18	100		
0.6	100		
0.425	100		
0.3	100		
0.212	95		
0.15	50		
0.063	2		

Dry Mass of sample, g	472

Sample Proportions	% dry mass
Very coarse	0.0
Gravel	0.0
Sand	97.7
Fines <0.063mm	2.0

Grading Analysis		
D100	mm	
D60	mm	0.162
D30	mm	0.104
D10	mm	0.0724
Uniformity Coefficient		2.2
Curvature Coefficient		0.92

Remarks
Preparation and testing in accordance with test method unless noted below

Accreditation status
Hydrometer is the usual Sedimentation method carried out by G2M Testing and is part of the G2M Testing UKAS accreditation schedule.

Approved by	JBrischuk
Approval date	20/07/2023 16:24

PARTICLE SIZE DISTRIBUTION

Site name	Job number
Ardersier Port	S230503

G2M Testing (Stockton)
12-16 Yarm Road,
Stockton on Tees,
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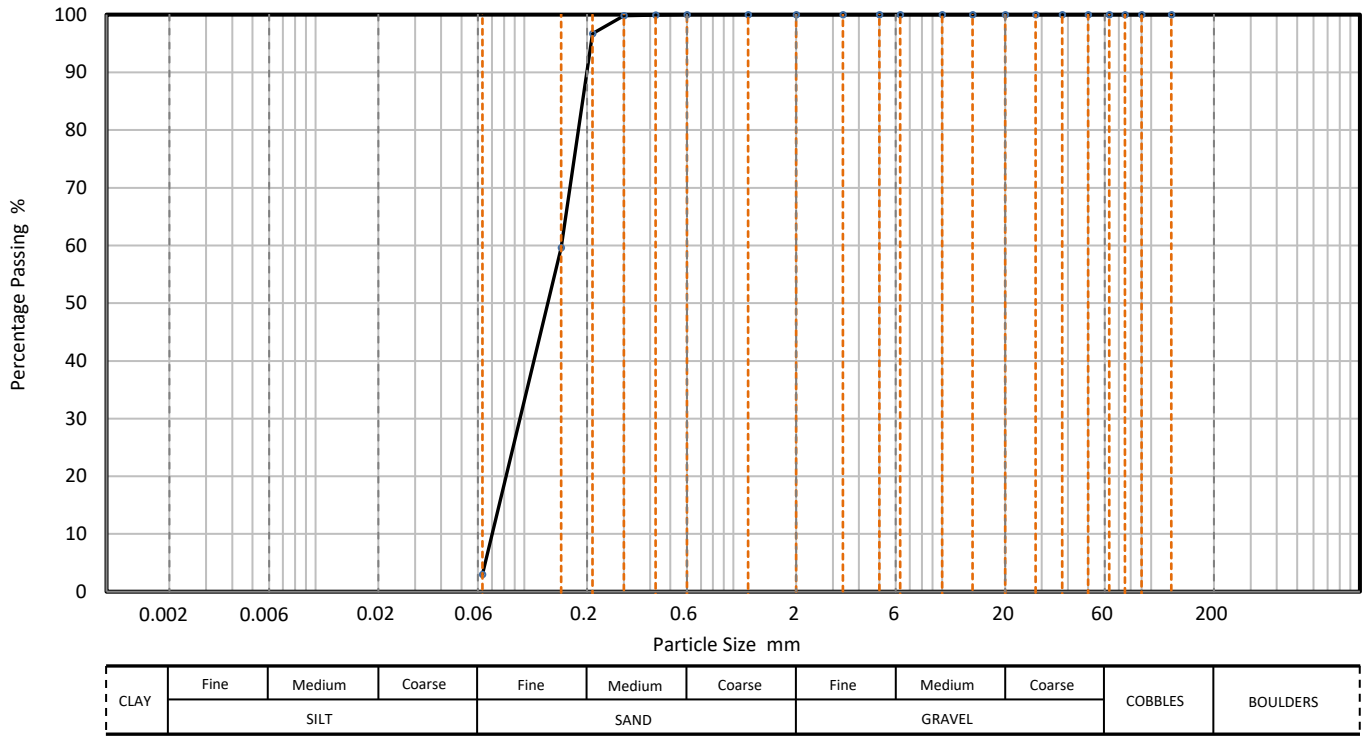
Hole	BHSP05	Lab sample ID	G2MT20230714118
Depth (Top) m	30.00	Test Method	BS 1377 - 2 : 1990 Clause 9.2
Depth (Base) m		Soil Description	Slightly Clayey, SAND
Sample type	B		



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	100		
6.3	100		
5	100		
3.35	100		
2	100		
1.18	100		
0.6	100		
0.425	100		
0.3	100		
0.212	97		
0.15	60		
0.063	3		

Dry Mass of sample, g	435

Sample Proportions	% dry mass
Very coarse	0.0
Gravel	0.0
Sand	97.0
Fines <0.063mm	3.0

Grading Analysis		
D100	mm	
D60	mm	0.151
D30	mm	0.0953
D10	mm	0.0701
Uniformity Coefficient		2.1
Curvature Coefficient		0.86

Remarks
Preparation and testing in accordance with test method unless noted below

Accreditation status
Hydrometer is the usual Sedimentation method carried out by G2M Testing and is part of the G2M Testing UKAS accreditation schedule.

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Approval date	20/07/2023 16:24

PARTICLE SIZE DISTRIBUTION

Site name	Job number
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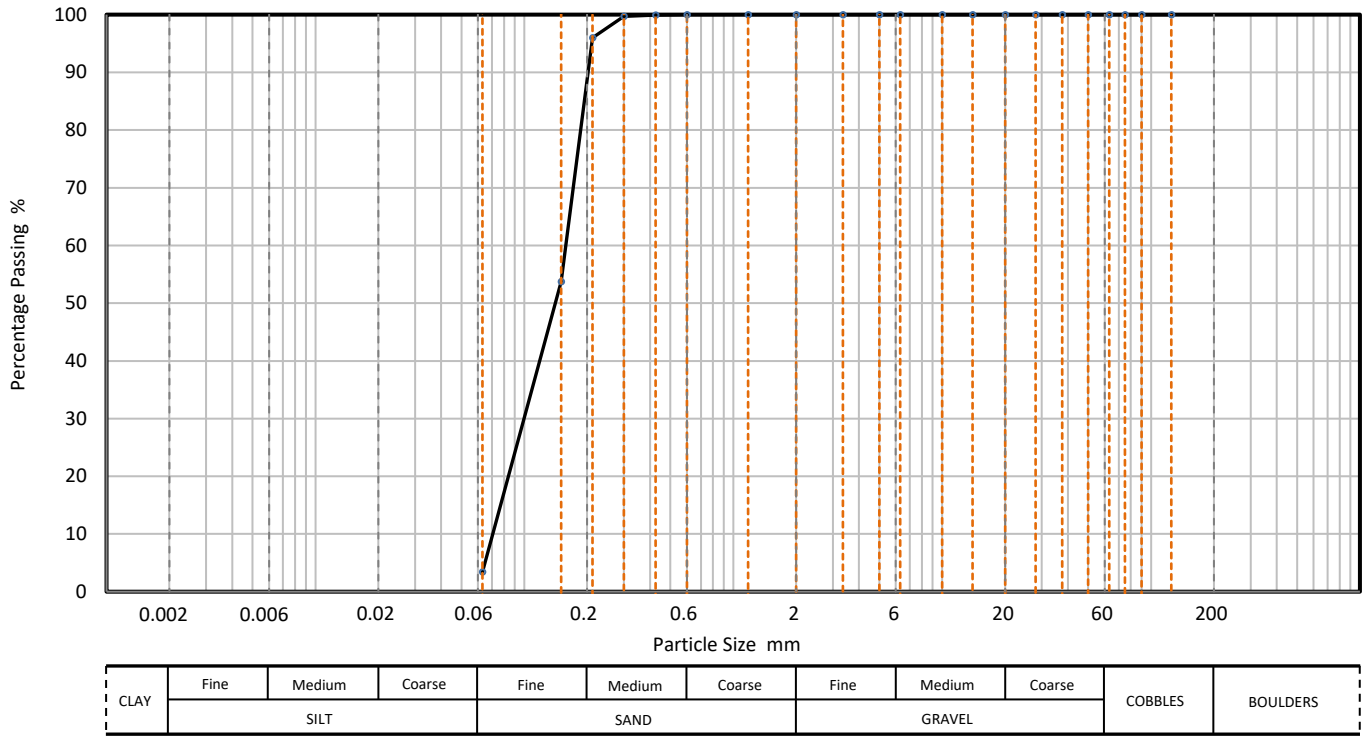
Hole		BHSP05	Lab sample ID	G2MT20230714119
Depth (Top)	m	33.00	Test Method	BS 1377 - 2 : 1990 Clause 9.2
Depth (Base)	m		Soil Description	Slightly Clayey SAND
Sample type		B		



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	100		
6.3	100		
5	100		
3.35	100		
2	100		
1.18	100		
0.6	100		
0.425	100		
0.3	100		
0.212	96		
0.15	54		
0.063	3		

Dry Mass of sample, g	462

Sample Proportions	% dry mass
Very coarse	0.0
Gravel	0.0
Sand	96.6
Fines <0.063mm	3.0

Grading Analysis		
D100	mm	
D60	mm	0.158
D30	mm	0.0997
D10	mm	0.0706
Uniformity Coefficient		2.2
Curvature Coefficient		0.89

Remarks
Preparation and testing in accordance with test method unless noted below

Accreditation status
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Approved by	JBrischuk
Approval date	20/07/2023 16:24

PARTICLE SIZE DISTRIBUTION

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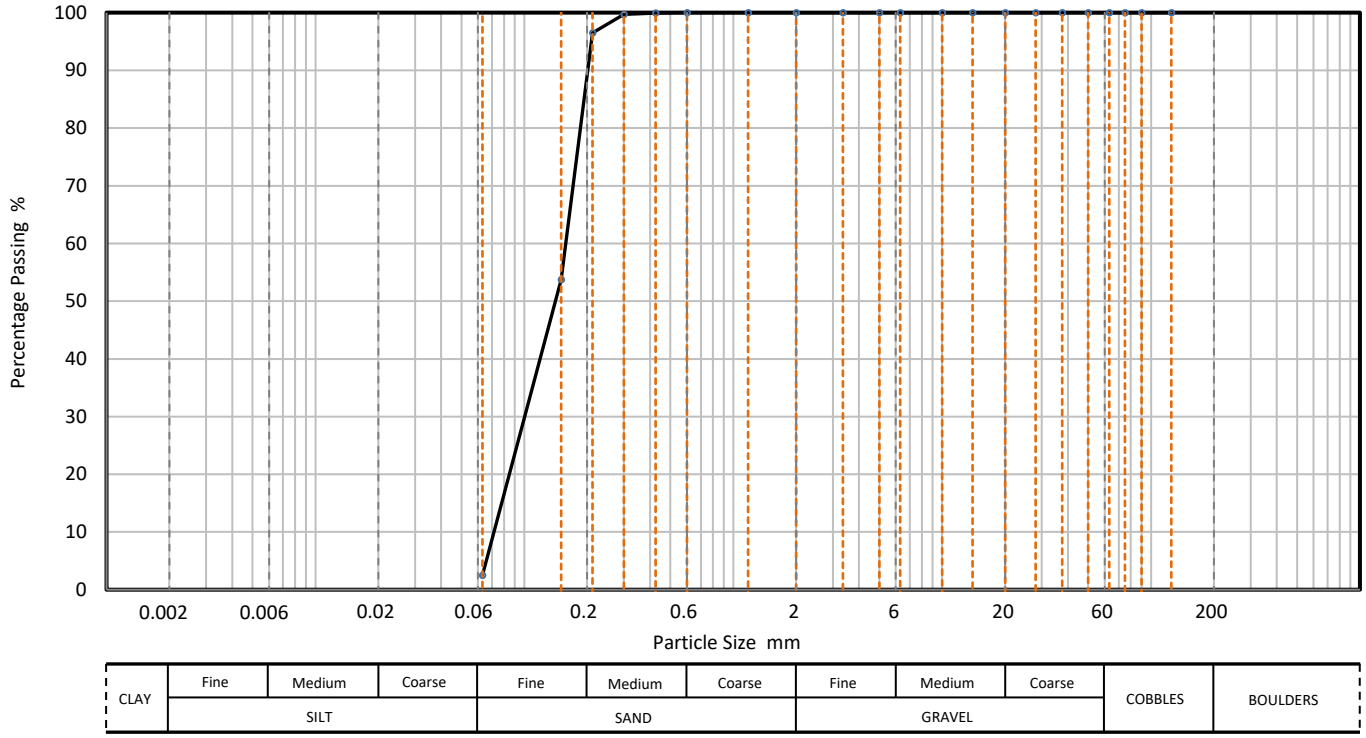
Hole		BHSP05	Lab sample ID	G2MT20230714120
Depth (Top)	m	36.00	Test Method	BS 1377 - 2 : 1990 Clause 9.2
Depth (Base)	m		Soil Description	Slightly Clayey SAND
Sample type		B		



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	100		
6.3	100		
5	100		
3.35	100		
2	100		
1.18	100		
0.6	100		
0.425	100		
0.3	100		
0.212	97		
0.15	54		
0.063	3		

Dry Mass of sample, g	464

Sample Proportions	% dry mass
Very coarse	0.0
Gravel	0.0
Sand	97.4
Fines <0.063mm	3.0

Grading Analysis		
D100	mm	
D60	mm	0.158
D30	mm	0.1
D10	mm	0.0715
Uniformity Coefficient		2.2
Curvature Coefficient		0.89

Remarks
Preparation and testing in accordance with test method unless noted below

Accreditation status
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Approval date	20/07/2023 16:24

PARTICLE SIZE DISTRIBUTION

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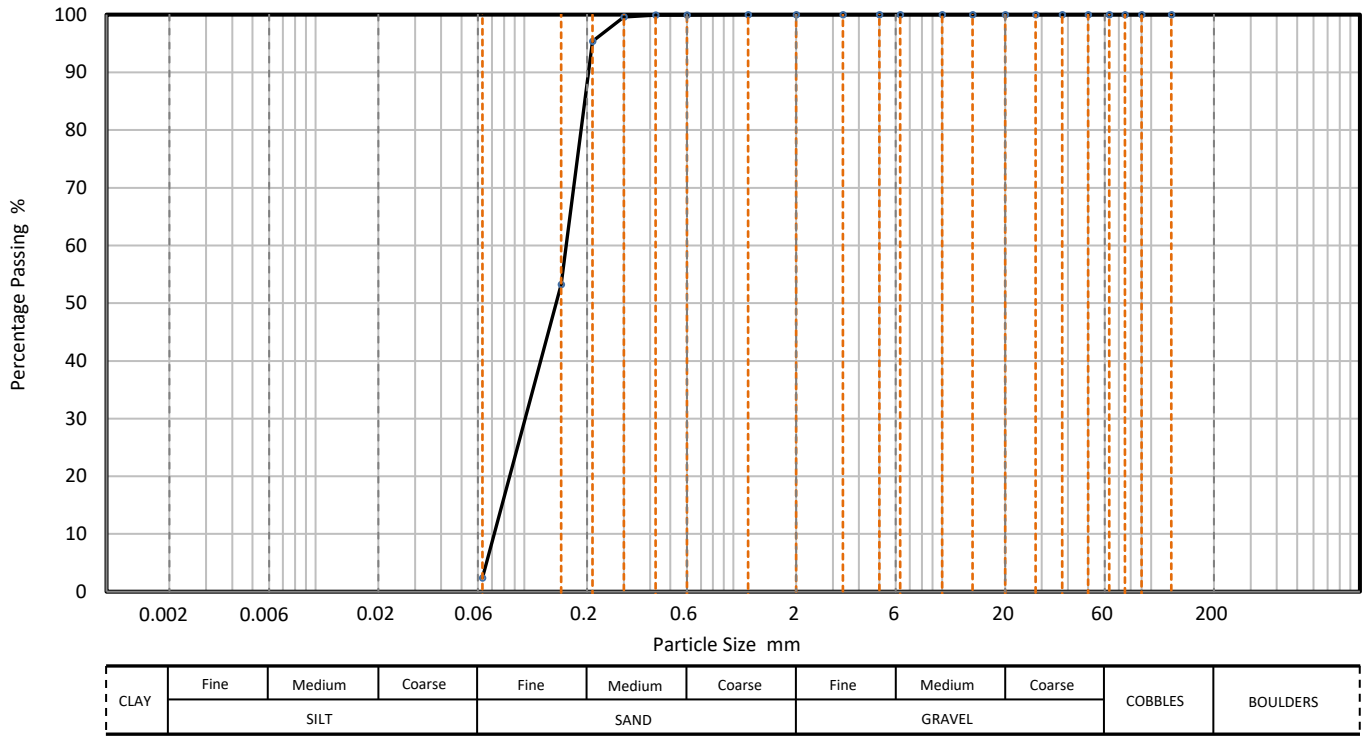
Hole	BHSP05	Lab sample ID	G2MT20230714121
Depth (Top) m	39.00	Test Method	BS 1377 - 2 : 1990 Clause 9.2
Depth (Base) m		Soil Description	Slightly Clayey, SAND
Sample type	B		



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	100		
6.3	100		
5	100		
3.35	100		
2	100		
1.18	100		
0.6	100		
0.425	100		
0.3	100		
0.212	95		
0.15	53		
0.063	2		

Dry Mass of sample, g	453

Sample Proportions	% dry mass
Very coarse	0.0
Gravel	0.0
Sand	97.6
Fines <0.063mm	2.0

Grading Analysis		
D100	mm	
D60	mm	0.159
D30	mm	0.101
D10	mm	0.0718
Uniformity Coefficient		2.2
Curvature Coefficient		0.9

Remarks
Preparation and testing in accordance with test method unless noted below

Accreditation status
Hydrometer is the usual Sedimentation method carried out by G2M Testing and is part of the G2M Testing UKAS accreditation schedule.

Approved by	JBrischuk
Approval date	20/07/2023 16:24

Laboratory Report Front Sheet

G2M Testing (Stockton)
12-16 Yarm Road,
Stockton on Tees,
TS18 3NA
01642 033318
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Site name	Job number
Ardersier Port	S230503

Client details:

Reference:	S230503
Name:	Solmek
Address:	12 Yarm Road, Stockton-on-tees, TS18 3NA
Telephone:	01642 607083
Email:	acutts@solmek.com
FAO:	Adrian Cutts

Samples received:

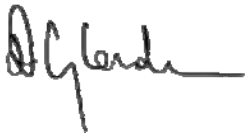
Date commenced: 27/06/2023

Date reported: 30/06/2023

Observations and interpretations are outside of the UKAS Accreditiation

A copy of the Laboratory Schedule of accredited tests as issued by UKAS is attached to this report. This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This certificate shall not be reproduced in full, without the prior written approval of the laboratory.

Samples will be held at the laboratory for a period of 4 weeks after the report date. After the above reporting date the samples will be disposed of. Should further testing be required then the office should be informed before the above date.

Signature:	Approved Signitories:
	☑ D.Anderson (Managing Director) ☐ J. Brischuk (Laboratory Manager) ☐

Summary of Classification Tests

G2M Testing (Stockton)
12-16 Yarm Road,
Stockton on Tees,
TS18 3NA
01642 033318
info@g2mtesting.co.uk

UKAS TESTING

10258

Site name	Job number
Ardersier Port	S230503

Hole	Depth Top m	Depth Base m	Type	*w* %	Oven temp. oc	wa %	Pa %	Pr %	wL %	wP %	IP %	IL	Plasticity class	Preparation method
BHSP06	0.30		B	5.2	105									
BHSP06	1.20		B	22	105									
BHSP06	3.00		B	22	105									
BHSP06	5.00		B	20	105									
BHSP06	7.00		B	18	105									
BHSP06	9.00		B	20	105									
BHSP06	12.00		B	32	105									
BHSP06	15.00		B	22	105									
BHSP06	18.00		B	20	105									
BHSP06	21.00		B	21	105									
BHSP06	24.00		B	9.3	105									
BHSP06	27.00		B	23	105									
BHSP06	30.00		B	20	105									
BHSP06	31.50		B	20	105									
BHSP06	34.50		B	20	105									
BHSP06	36.00		B	20	105									
BHSP06	39.00		D	14	105									

All tests found in G2M Testing UKAS Schedule of Accreditation are tested to standard unless otherwise indicated

Key	Description		Category	BS Test Code
w	Moisture content			BS 1377:1990 Part 2 Clause 3.2
wa	Equivalent moisture content passing 425µm sieve			BS 1377:1990 Part 2 Clause 3.2
wL	Liquid limit	Single point	-s	BS 1377:1990 Part 2 Clause 4.4
		Four point	-f	BS 1377:1990 Part 2 Clause 4.3
wP	Plastic limit			BS 1377:1990 Part 2 Clause 5.2
Pa	Percentage passing 425um sieve			
Pr	Percentage retained 425um sieve			
IP	Plasticity index			BS 1377:1990 Part 2 Clause 5.4
IL	Liquidity index			BS 1377:1990 Part 2 Clause 5.4
	Suffix indicating test is "Not UKAS Accredited"		*	

Approved by	D Anderson
Approval date	30/06/2023 11:50
Date report generated	
Report Number	

PARTICLE SIZE DISTRIBUTION

Site name	Job number
Ardersier Port	S230503

G2M Testing (Stockton)
12-16 Yarm Road,
Stockton on Tees,
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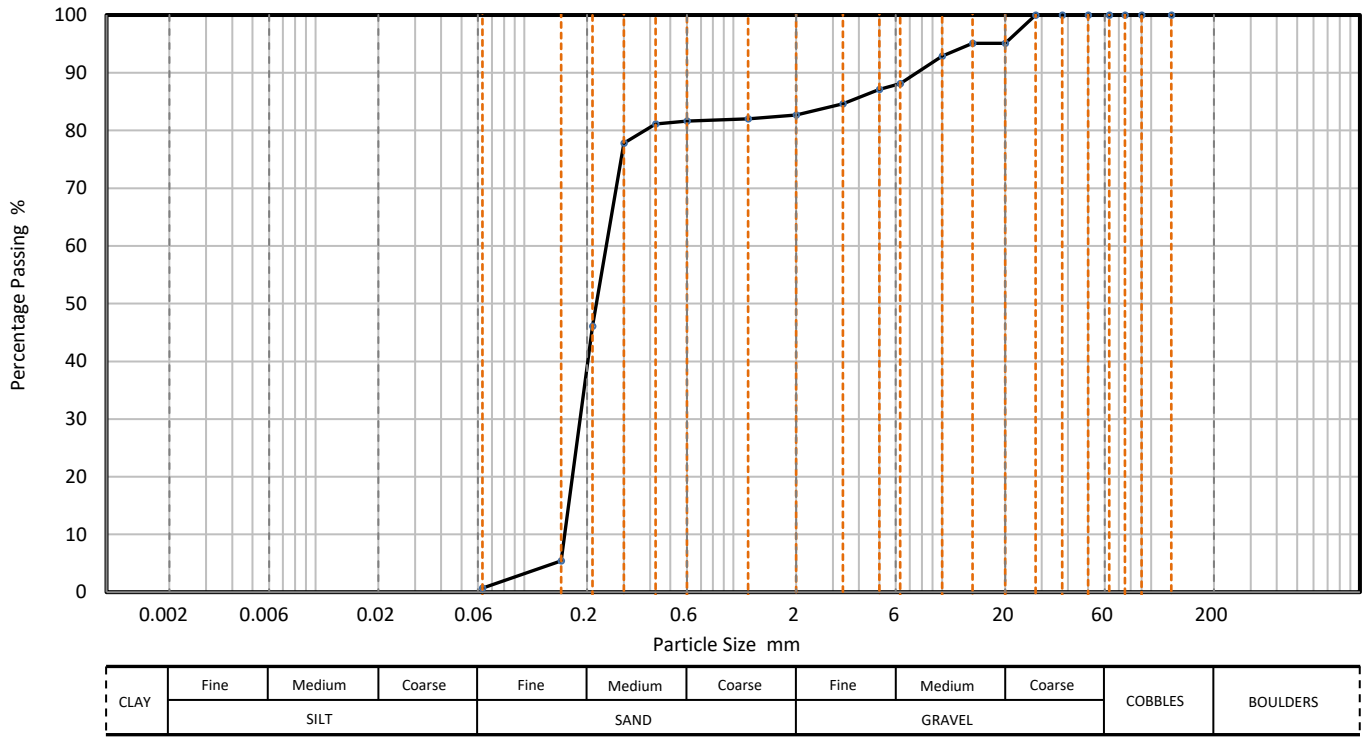
UKAS TESTING
10258

Hole	BHSP06	Lab sample ID	G2MT2023062722
Depth (Top) m	0.30	Test Method	BS 1377 - 2 : 1990 Clause 9.2
Depth (Base) m		Soil Description	Very slightly Silty, Gravelly, SAND
Sample type	B		



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	95		
14	95		
10	93		
6.3	88		
5	87		
3.35	85		
2	83		
1.18	82		
0.6	82		
0.425	81		
0.3	78		
0.212	46		
0.15	5		
0.063	1		

Dry Mass of sample, g: 1167

Sample Proportions	% dry mass
Very coarse	0.0
Gravel	17.3
Sand	82.0
Fines <0.063mm	1.0

Grading Analysis		
D100	mm	
D60	mm	0.247
D30	mm	0.185
D10	mm	0.156
Uniformity Coefficient		1.6
Curvature Coefficient		0.89

Remarks

Preparation and testing in accordance with test method unless noted below

Sample tested was deviating in accordance with BS1377 test standard

Accreditation status

Hydrometer is the usual Sedimentation method carried out by G2M Testing and is part of the G2M Testing UKAS accreditation schedule.

Approved by	D Anderson
Approval date	30/06/2023 12:41

PARTICLE SIZE DISTRIBUTION

Site name	Job number
Ardersier Port	S230503

G2M Testing (Stockton)
12-16 Yarm Road,
Stockton on Tees,
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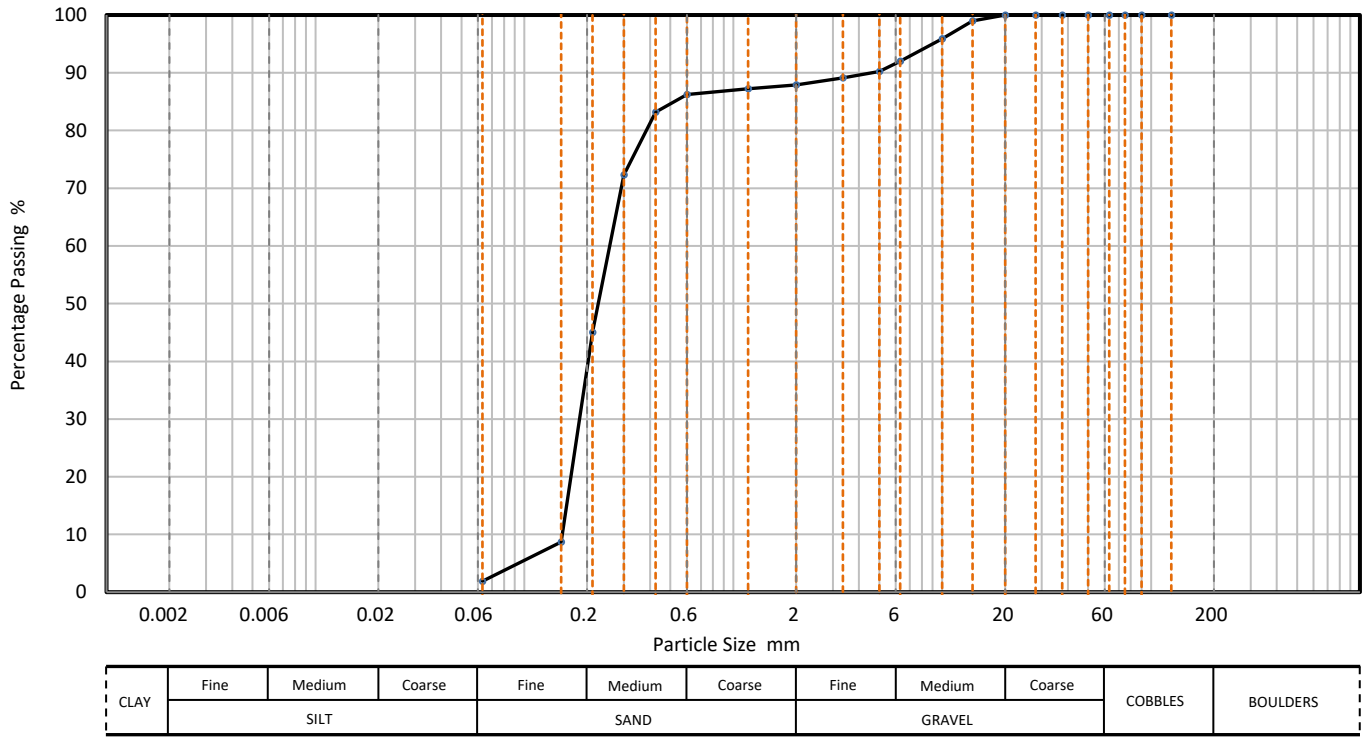
UKAS TESTING
10258

Hole	BHSP06	Lab sample ID	G2MT2023062723
Depth (Top) m	1.20	Test Method	BS 1377 - 2 : 1990 Clause 9.2
Depth (Base) m		Soil Description	Slightly Silty, Gravelly, SAND
Sample type	B		



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	99		
10	96		
6.3	92		
5	90		
3.35	89		
2	88		
1.18	87		
0.6	86		
0.425	83		
0.3	72		
0.212	45		
0.15	9		
0.063	2		

Dry Mass of sample, g: 1041

Sample Proportions	% dry mass
Very coarse	0.0
Gravel	12.1
Sand	86.0
Fines <0.063mm	2.0

Grading Analysis		
D100	mm	
D60	mm	0.257
D30	mm	0.184
D10	mm	0.152
Uniformity Coefficient		1.7
Curvature Coefficient		0.87

Remarks
Preparation and testing in accordance with test method unless noted below

Accreditation status
Hydrometer is the usual Sedimentation method carried out by G2M Testing and is part of the G2M Testing UKAS accreditation schedule.

Approved by	D Anderson
Approval date	30/06/2023 12:44

PARTICLE SIZE DISTRIBUTION

Site name	Job number
Ardersier Port	S230503

G2M Testing (Stockton)
12-16 Yarm Road,
Stockton on Tees,
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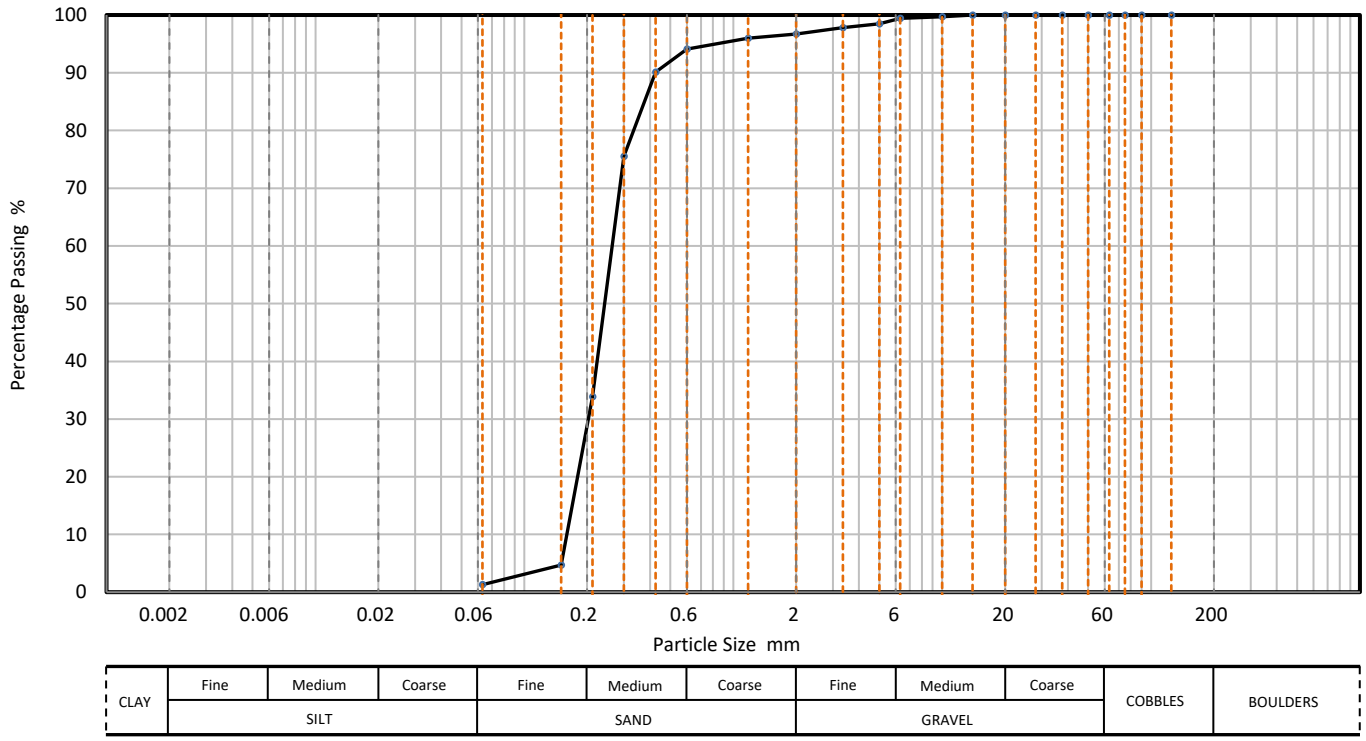
UKAS TESTING
10258

Hole	BHSP06	Lab sample ID	G2MT2023062724
Depth (Top) m	3.00	Test Method	BS 1377 - 2 : 1990 Clause 9.2
Depth (Base) m		Soil Description	Very slightly Silty, slightly Gravelly, SAND
Sample type	B		



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	100		
6.3	99		
5	99		
3.35	98		
2	97		
1.18	96		
0.6	94		
0.425	90		
0.3	76		
0.212	34		
0.15	5		
0.063	1		

Dry Mass of sample, g: 1158

Sample Proportions	% dry mass
Very coarse	0.0
Gravel	3.3
Sand	95.4
Fines <0.063mm	1.0

Grading Analysis		
D100	mm	
D60	mm	0.264
D30	mm	0.202
D10	mm	0.16
Uniformity Coefficient		1.7
Curvature Coefficient		0.97

Remarks
Preparation and testing in accordance with test method unless noted below

Accreditation status
Hydrometer is the usual Sedimentation method carried out by G2M Testing and is part of the G2M Testing UKAS accreditation schedule.

Approved by	D Anderson
Approval date	30/06/2023 12:48

PARTICLE SIZE DISTRIBUTION

Site name	Job number
Ardersier Port	S230503

G2M Testing (Stockton)
12-16 Yarm Road,
Stockton on Tees,
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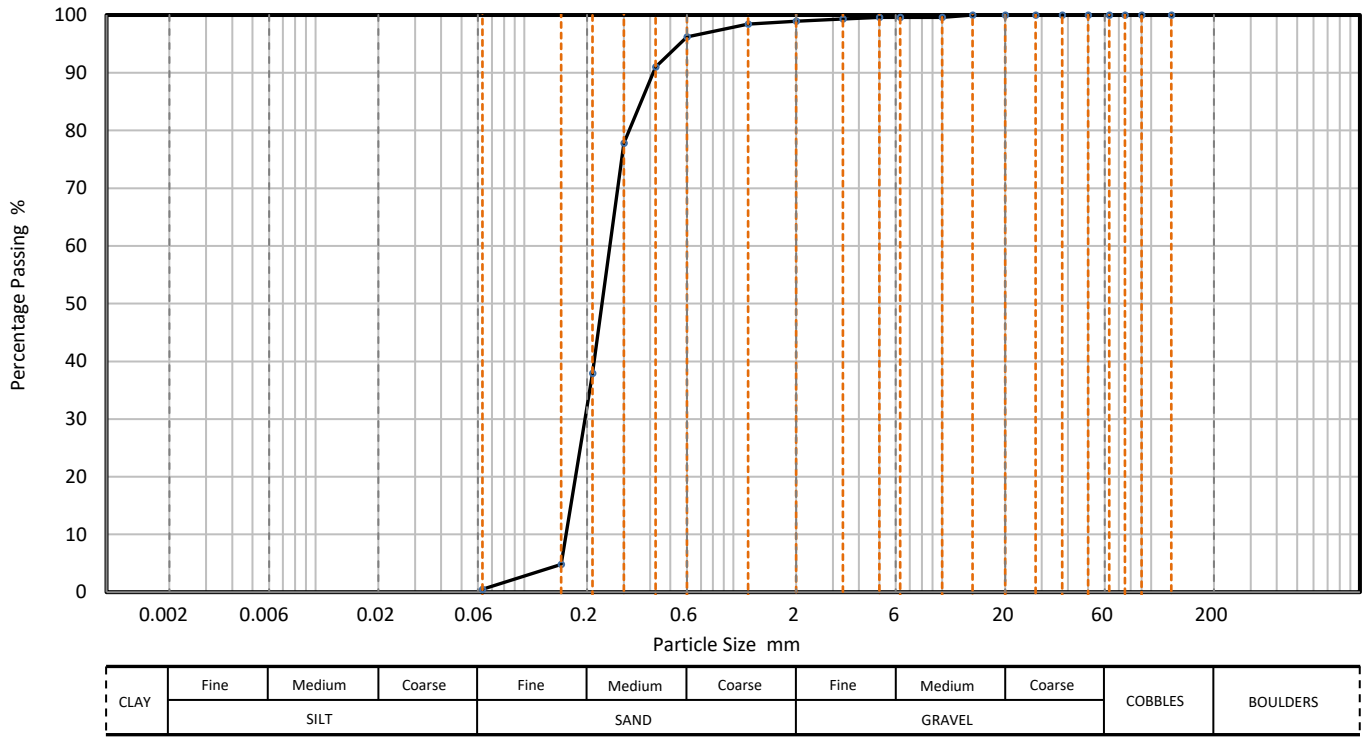
info@g2mtesting.co.uk

UKAS TESTING
10258

Hole	BHSP06	Lab sample ID	G2MT2023062725
Depth (Top) m	5.00	Test Method	BS 1377 - 2 : 1990 Clause 9.2
Depth (Base) m		Soil Description	Very slightly Silty, very slightly Gravelly, SAND
Sample type	B		



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	100		
6.3	100		
5	100		
3.35	99		
2	99		
1.18	98		
0.6	96		
0.425	91		
0.3	78		
0.212	38		
0.15	5		
0.063	1		

Dry Mass of sample, g	959

Sample Proportions	% dry mass
Very coarse	0.0
Gravel	1.1
Sand	98.4
Fines <0.063mm	1.0

Grading Analysis		
D100	mm	
D60	mm	0.257
D30	mm	0.195
D10	mm	0.158
Uniformity Coefficient		1.6
Curvature Coefficient		0.94

Remarks
Preparation and testing in accordance with test method unless noted below

Accreditation status
Hydrometer is the usual Sedimentation method carried out by G2M Testing and is part of the G2M Testing UKAS accreditation schedule.

Approved by	D Anderson
Approval date	30/06/2023 10:06

PARTICLE SIZE DISTRIBUTION

Site name	Job number
Ardersier Port	S230503

G2M Testing (Stockton)
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Stockton on Tees,
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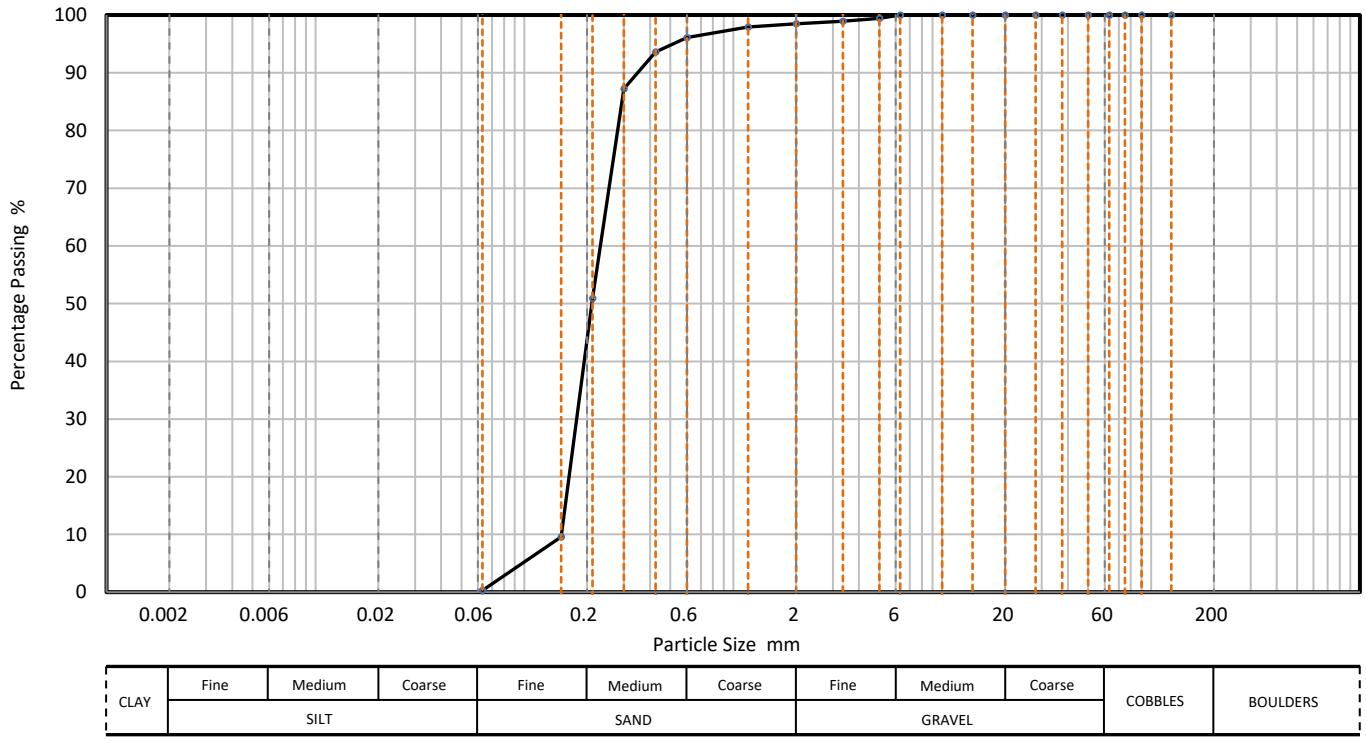
UKAS TESTING
10258

Hole	BHSP06	Lab sample ID	G2MT2023062726
Depth (Top) m	7.00	Test Method	BS 1377 - 2 : 1990 Clause 9.2
Depth (Base) m		Soil Description	Very slightly Gravelly, SAND
Sample type	B		



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	100		
6.3	100		
5	99		
3.35	99		
2	99		
1.18	98		
0.6	96		
0.425	94		
0.3	87		
0.212	51		
0.15	10		
0.063	0		

Dry Mass of sample, g	994

Sample Proportions	% dry mass
Very coarse	0.0
Gravel	1.5
Sand	98.2
Fines <0.063mm	0.0

Grading Analysis		
D100	mm	
D60	mm	0.231
D30	mm	0.178
D10	mm	0.151
Uniformity Coefficient		1.5
Curvature Coefficient		0.91

Remarks
Preparation and testing in accordance with test method unless noted below

Accreditation status
Hydrometer is the usual Sedimentation method carried out by G2M Testing and is part of the G2M Testing UKAS accreditation schedule.

Approved by	D Anderson
Approval date	30/06/2023 10:09

PARTICLE SIZE DISTRIBUTION

Site name	Job number
Ardersier Port	S230503

G2M Testing (Stockton)
12-16 Yarm Road,
Stockton on Tees,
TS18 3NA
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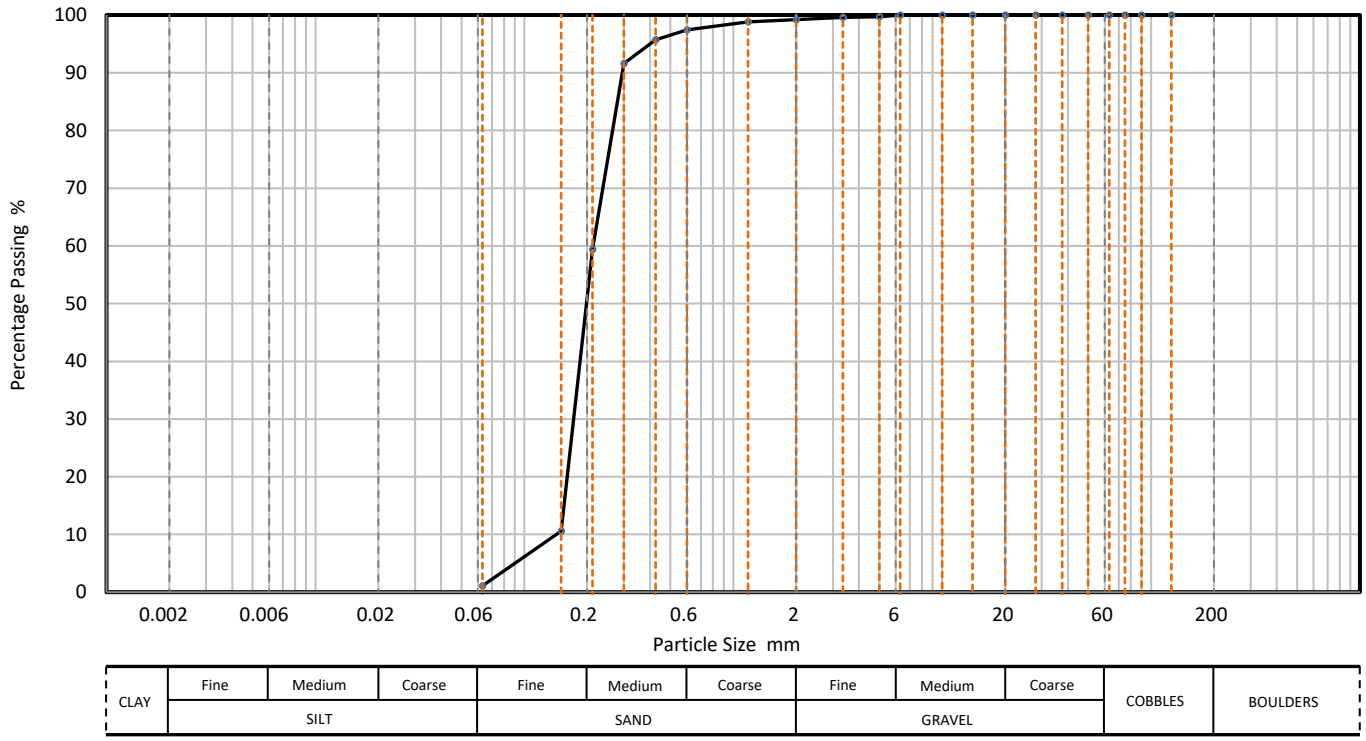
info@g2mtesting.co.uk

UKAS TESTING
10258

Hole	BHSP06	Lab sample ID	G2MT2023062727
Depth (Top) m	9.00	Test Method	BS 1377 - 2 : 1990 Clause 9.2
Depth (Base) m		Soil Description	Very slightly Silty, very slightly Gravelly, SAND
Sample type	B		



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	100		
6.3	100		
5	100		
3.35	100		
2	99		
1.18	99		
0.6	97		
0.425	96		
0.3	92		
0.212	59		
0.15	11		
0.063	1		

Dry Mass of sample, g: 845

Sample Proportions	% dry mass
Very coarse	0.0
Gravel	0.8
Sand	98.1
Fines <0.063mm	1.0

Grading Analysis		
D100	mm	
D60	mm	0.213
D30	mm	0.172
D10	mm	0.143
Uniformity Coefficient		1.5
Curvature Coefficient		0.97

Remarks
Preparation and testing in accordance with test method unless noted below

Accreditation status
Hydrometer is the usual Sedimentation method carried out by G2M Testing and is part of the G2M Testing UKAS accreditation schedule.

Approved by	D Anderson
Approval date	30/06/2023 12:52

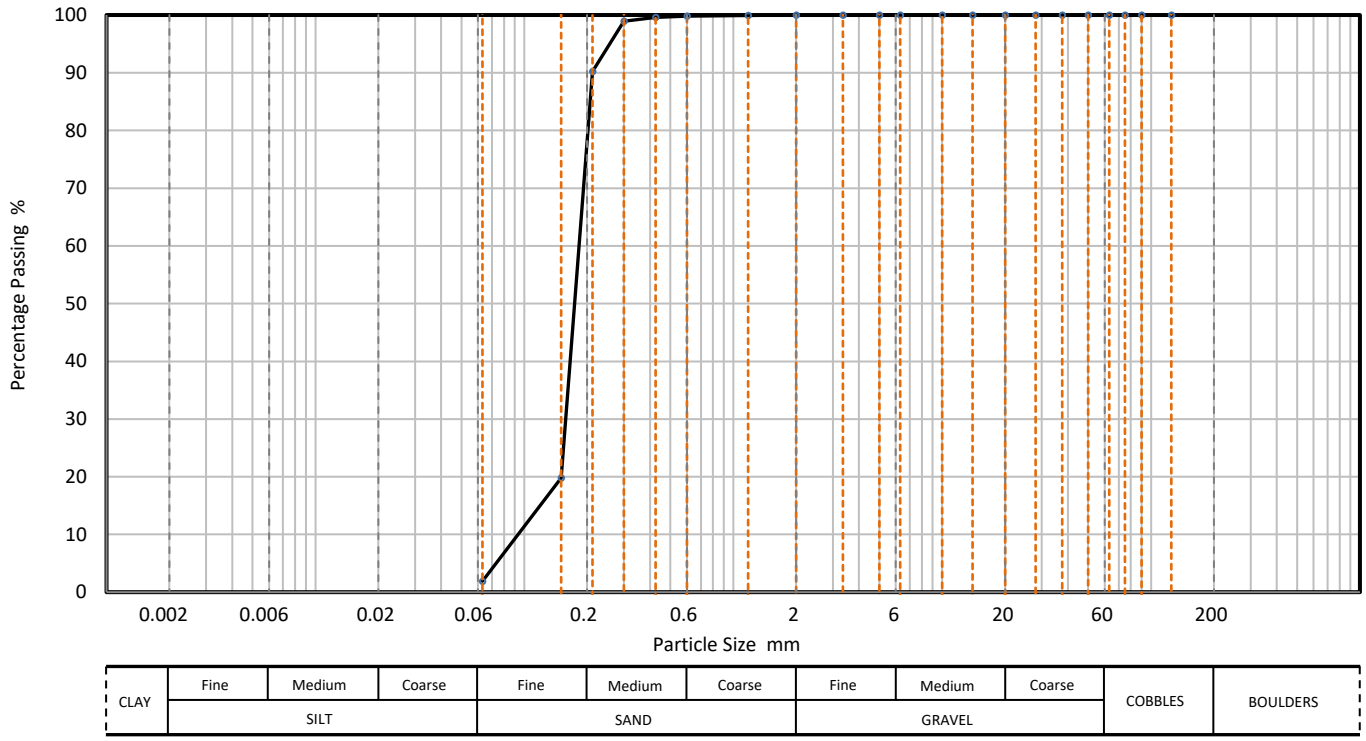
PARTICLE SIZE DISTRIBUTION

Site name	Job number
Ardersier Port	S230503

G2M Testing (Stockton)
12-16 Yarm Road,
Stockton on Tees,
TS18 3NA
01642 033318
info@g2mtesting.co.uk

UKAS TESTING
10258

Hole	BHSP06	Lab sample ID	G2MT2023062728
Depth (Top) m	12.00	Test Method	BS 1377 - 2 : 1990 Clause 9.2
Depth (Base) m		Soil Description	Slightly Silty, SAND
Sample type	B		



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	100		
6.3	100		
5	100		
3.35	100		
2	100		
1.18	100		
0.6	100		
0.425	100		
0.3	99		
0.212	90		
0.15	20		
0.063	2		

Dry Mass of sample, g	731

Sample Proportions	% dry mass
Very coarse	0.0
Gravel	0.0
Sand	98.1
Fines <0.063mm	2.0

Grading Analysis		
D100	mm	
D60	mm	0.183
D30	mm	0.158
D10	mm	0.0934
Uniformity Coefficient		2
Curvature Coefficient		1.5

Remarks
Preparation and testing in accordance with test method unless noted below

Accreditation status
Hydrometer is the usual Sedimentation method carried out by G2M Testing and is part of the G2M Testing UKAS accreditation schedule.

Approved by	D Anderson
Approval date	30/06/2023 12:54

PARTICLE SIZE DISTRIBUTION

Site name	Job number
Ardersier Port	S230503

G2M Testing (Stockton)
12-16 Yarm Road,
Stockton on Tees,
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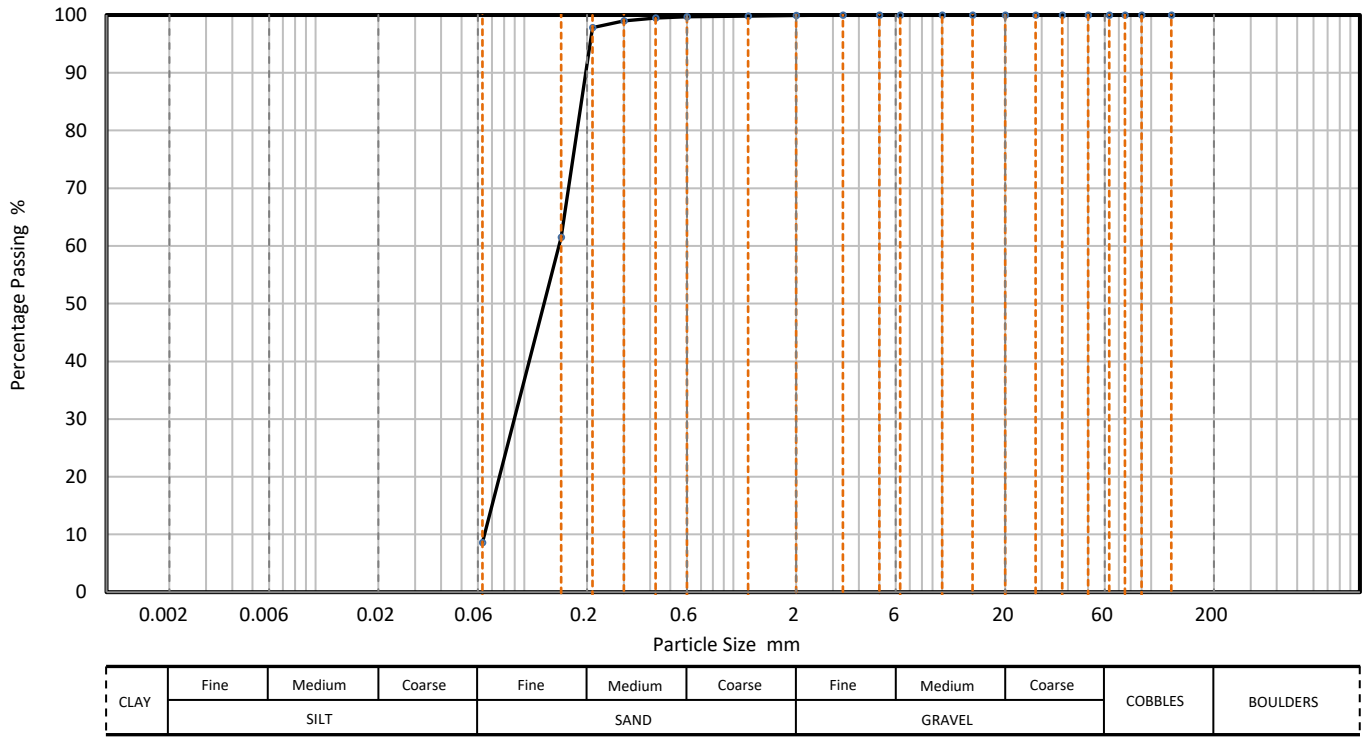
info@g2mtesting.co.uk

UKAS TESTING
10258

Hole	BHSP06	Lab sample ID	G2MT2023062729
Depth (Top) m	15.00	Test Method	BS 1377 - 2 : 1990 Clause 9.2
Depth (Base) m		Soil Description	Very slightly Gravelly, slightly Silty, SAND
Sample type	B		



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	100		
6.3	100		
5	100		
3.35	100		
2	100		
1.18	100		
0.6	100		
0.425	100		
0.3	99		
0.212	98		
0.15	62		
0.063	9		

Dry Mass of sample, g	698

Sample Proportions	% dry mass
Very coarse	0.0
Gravel	0.1
Sand	91.3
Fines <0.063mm	9.0

Grading Analysis		
D100	mm	
D60	mm	0.146
D30	mm	0.0895
D10	mm	0.0644
Uniformity Coefficient		2.3
Curvature Coefficient		0.85

Remarks
Preparation and testing in accordance with test method unless noted below

Accreditation status
Hydrometer is the usual Sedimentation method carried out by G2M Testing and is part of the G2M Testing UKAS accreditation schedule.

Approved by	D Anderson
Approval date	30/06/2023 10:12

PARTICLE SIZE DISTRIBUTION

Site name	Job number
Ardersier Port	S230503

G2M Testing (Stockton)
12-16 Yarm Road,
Stockton on Tees,
TS18 3NA
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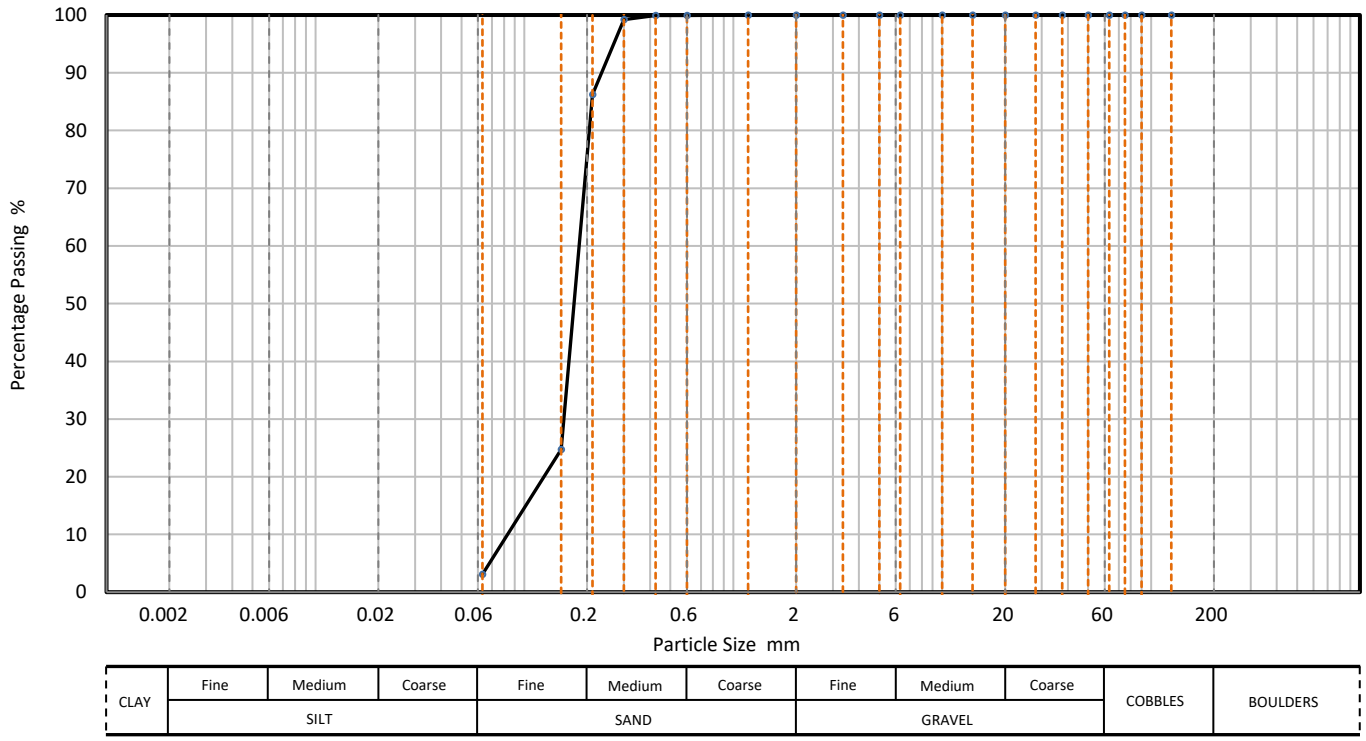
UKAS TESTING
10258

Hole	BHSP06	Lab sample ID	G2MT2023062730
Depth (Top) m	18.00	Test Method	BS 1377 - 2 : 1990 Clause 9.2
Depth (Base) m		Soil Description	Slightly Silty, SAND
Sample type	B		



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	100		
6.3	100		
5	100		
3.35	100		
2	100		
1.18	100		
0.6	100		
0.425	100		
0.3	99		
0.212	86		
0.15	25		
0.063	3		

Dry Mass of sample, g: 865

Sample Proportions	% dry mass
Very coarse	0.0
Gravel	0.0
Sand	96.9
Fines <0.063mm	3.0

Grading Analysis		
D100	mm	
D60	mm	0.183
D30	mm	0.155
D10	mm	0.0831
Uniformity Coefficient		2.2
Curvature Coefficient		1.6

Remarks
Preparation and testing in accordance with test method unless noted below

Accreditation status
Hydrometer is the usual Sedimentation method carried out by G2M Testing and is part of the G2M Testing UKAS accreditation schedule.

Approved by	D Anderson
Approval date	30/06/2023 10:19

PARTICLE SIZE DISTRIBUTION

Site name	Job number
Ardersier Port	S230503

G2M Testing (Stockton)
12-16 Yarm Road,
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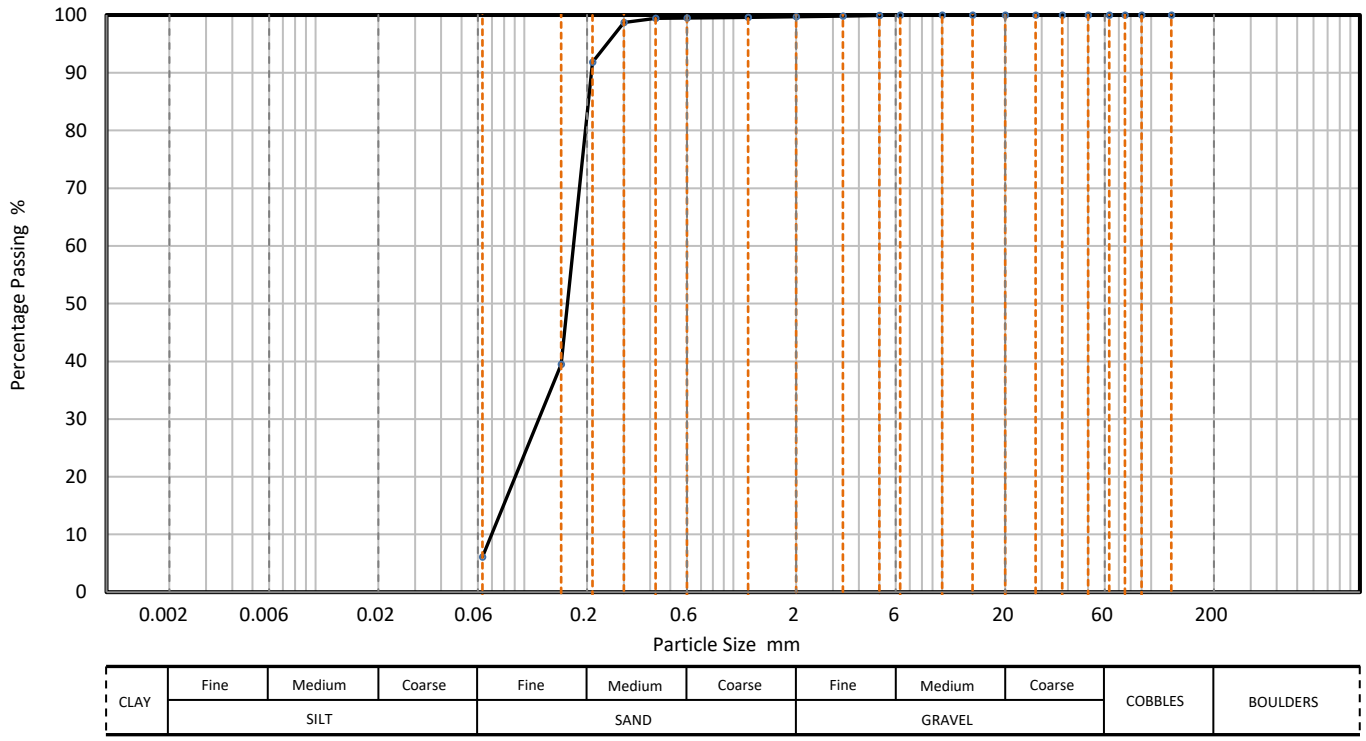
UKAS TESTING
10258

Hole	BHSP06	Lab sample ID	G2MT2023062731
Depth (Top) m	21.00	Test Method	BS 1377 - 2 : 1990 Clause 9.2
Depth (Base) m		Soil Description	Very slightly Gravelly, slightly Silty, SAND
Sample type	B		



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	100		
6.3	100		
5	100		
3.35	100		
2	100		
1.18	100		
0.6	100		
0.425	99		
0.3	99		
0.212	92		
0.15	40		
0.063	6		

Dry Mass of sample, g	896

Sample Proportions	% dry mass
Very coarse	0.0
Gravel	0.3
Sand	93.7
Fines <0.063mm	6.0

Grading Analysis		
D100	mm	
D60	mm	0.172
D30	mm	0.117
D10	mm	0.0698
Uniformity Coefficient		2.5
Curvature Coefficient		1.1

Remarks
Preparation and testing in accordance with test method unless noted below

Accreditation status
Hydrometer is the usual Sedimentation method carried out by G2M Testing and is part of the G2M Testing UKAS accreditation schedule.

Approved by	D Anderson
Approval date	30/06/2023 12:56

PARTICLE SIZE DISTRIBUTION

Site name	Job number
Ardersier Port	S230503

G2M Testing (Stockton)
12-16 Yarm Road,
Stockton on Tees,
TS18 3NA
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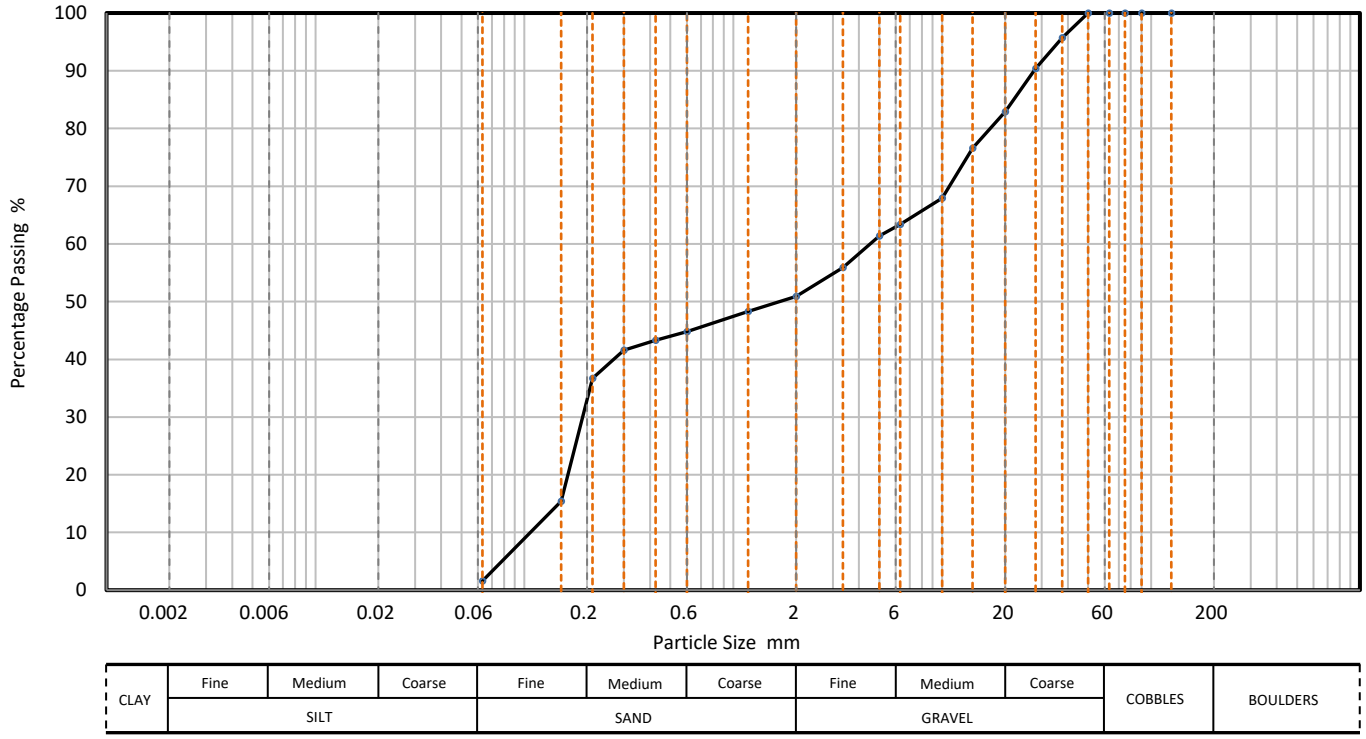
UKAS TESTING
10258

Hole	BHSP06	Lab sample ID	G2MT2023062732
Depth (Top) m	24.00	Test Method	BS 1377 - 2 : 1990 Clause 9.2
Depth (Base) m		Soil Description	Slightly Silty, very Gravelly, SAND
Sample type	B		



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	96		
28	90		
20	83		
14	77		
10	68		
6.3	63		
5	61		
3.35	56		
2	51		
1.18	48		
0.6	45		
0.425	43		
0.3	42		
0.212	37		
0.15	15		
0.063	2		

Dry Mass of sample, g: 2081

Sample Proportions	% dry mass
Very coarse	0.0
Gravel	49.1
Sand	49.3
Fines <0.063mm	2.0

Grading Analysis		
D100	mm	
D60	mm	4.52
D30	mm	0.19
D10	mm	0.107
Uniformity Coefficient		42
Curvature Coefficient		0.075

Remarks

Preparation and testing in accordance with test method unless noted below

Sample tested was deviating in accordance with BS1377 test standard

Accreditation status

Hydrometer is the usual Sedimentation method carried out by G2M Testing and is part of the G2M Testing UKAS accreditation schedule.

Approved by	D Anderson
Approval date	30/06/2023 10:16

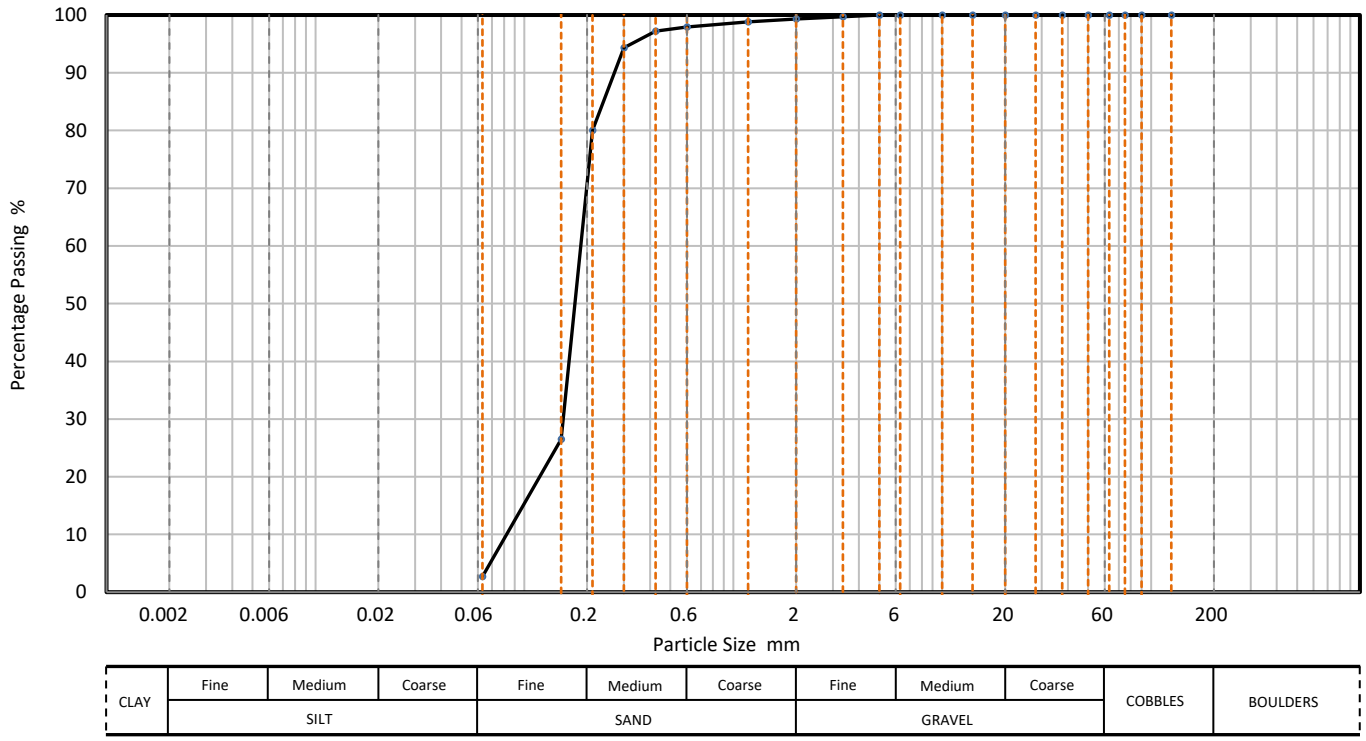
PARTICLE SIZE DISTRIBUTION

Site name	Job number
Ardersier Port	S230503

G2M Testing (Stockton)
12-16 Yarm Road,
Stockton on Tees,
TS18 3NA
01642 033318
info@g2mtesting.co.uk

UKAS TESTING
10258

Hole	BHSP06	Lab sample ID	G2MT2023062733
Depth (Top) m	27.00	Test Method	BS 1377 - 2 : 1990 Clause 9.2
Depth (Base) m		Soil Description	Very slightly Gravelly, slightly Silty, SAND
Sample type	B		



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	100		
6.3	100		
5	100		
3.35	100		
2	99		
1.18	99		
0.6	98		
0.425	97		
0.3	94		
0.212	80		
0.15	27		
0.063	3		

Dry Mass of sample, g	972

Sample Proportions	% dry mass
Very coarse	0.0
Gravel	0.7
Sand	96.6
Fines <0.063mm	3.0

Grading Analysis		
D100	mm	
D60	mm	0.186
D30	mm	0.153
D10	mm	0.0821
Uniformity Coefficient		2.3
Curvature Coefficient		1.5

Remarks
Preparation and testing in accordance with test method unless noted below

Accreditation status
Hydrometer is the usual Sedimentation method carried out by G2M Testing and is part of the G2M Testing UKAS accreditation schedule.

Approved by	D Anderson
Approval date	30/06/2023 12:59

PARTICLE SIZE DISTRIBUTION

Site name	Job number
Ardersier Port	S230503

G2M Testing (Stockton)
12-16 Yarm Road,
Stockton on Tees,
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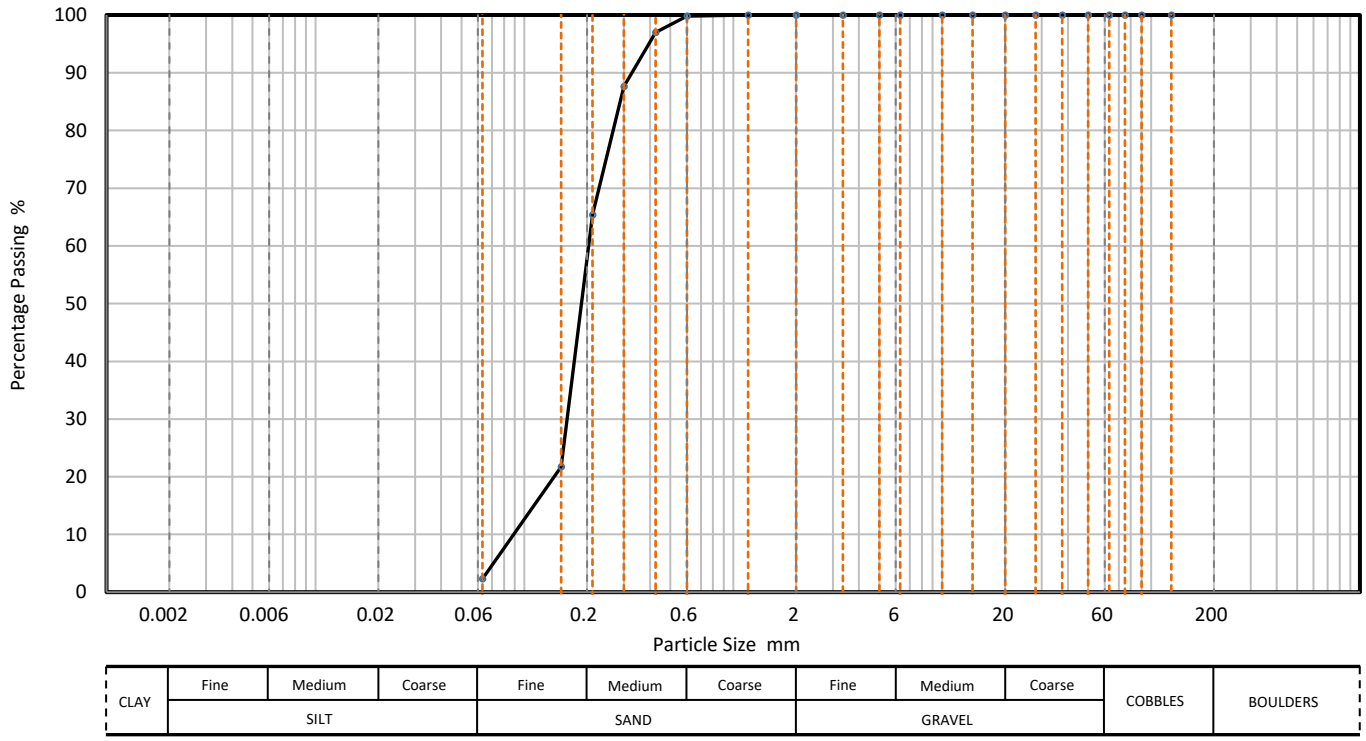
UKAS TESTING
10258

Hole	BHSP06	Lab sample ID	G2MT2023062734
Depth (Top) m	30.00	Test Method	BS 1377 - 2 : 1990 Clause 9.2
Depth (Base) m		Soil Description	Slightly Silty, SAND
Sample type	B		



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	100		
6.3	100		
5	100		
3.35	100		
2	100		
1.18	100		
0.6	100		
0.425	97		
0.3	88		
0.212	65		
0.15	22		
0.063	2		

Dry Mass of sample, g: 1095

Sample Proportions	% dry mass
Very coarse	0.0
Gravel	0.0
Sand	97.7
Fines <0.063mm	2.0

Grading Analysis		
D100	mm	
D60	mm	0.203
D30	mm	0.16
D10	mm	0.089
Uniformity Coefficient		2.3
Curvature Coefficient		1.4

Remarks

Preparation and testing in accordance with test method unless noted below

Accreditation status

Hydrometer is the usual Sedimentation method carried out by G2M Testing and is part of the G2M Testing UKAS accreditation schedule.

Approved by	D Anderson
Approval date	30/06/2023 13:02

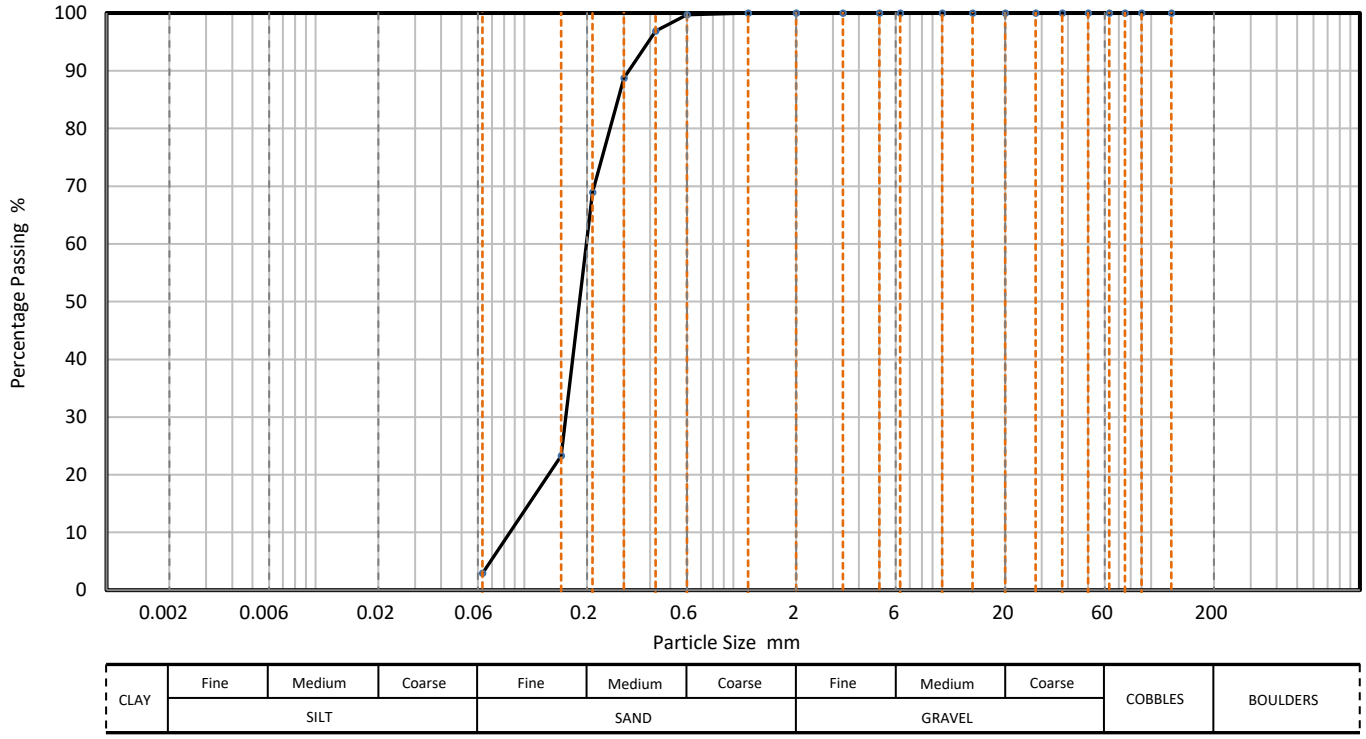
PARTICLE SIZE DISTRIBUTION

Site name	Job number
Ardersier Port	S230503

G2M Testing (Stockton)
12-16 Yarm Road,
Stockton on Tees,
TS18 3NA
01642 033318
info@g2mtesting.co.uk

UKAS TESTING
10258

Hole	BHSP06	Lab sample ID	G2MT2023062735
Depth (Top) m	31.50	Test Method	BS 1377 - 2 : 1990 Clause 9.2
Depth (Base) m		Soil Description	Slightly Silty, SAND
Sample type	B		



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	100		
6.3	100		
5	100		
3.35	100		
2	100		
1.18	100		
0.6	100		
0.425	97		
0.3	89		
0.212	69		
0.15	23		
0.063	3		

Dry Mass of sample, g: 1158

Sample Proportions	% dry mass
Very coarse	0.0
Gravel	0.0
Sand	97.1
Fines <0.063mm	3.0

Grading Analysis		
D100	mm	
D60	mm	0.198
D30	mm	0.158
D10	mm	0.0851
Uniformity Coefficient		2.3
Curvature Coefficient		1.5

Remarks
Preparation and testing in accordance with test method unless noted below

Accreditation status
Hydrometer is the usual Sedimentation method carried out by G2M Testing and is part of the G2M Testing UKAS accreditation schedule.

Approved by	D Anderson
Approval date	30/06/2023 13:04

PARTICLE SIZE DISTRIBUTION

Site name	Job number
Ardersier Port	S230503

G2M Testing (Stockton)
12-16 Yarm Road,
Stockton on Tees,
TS18 3NA
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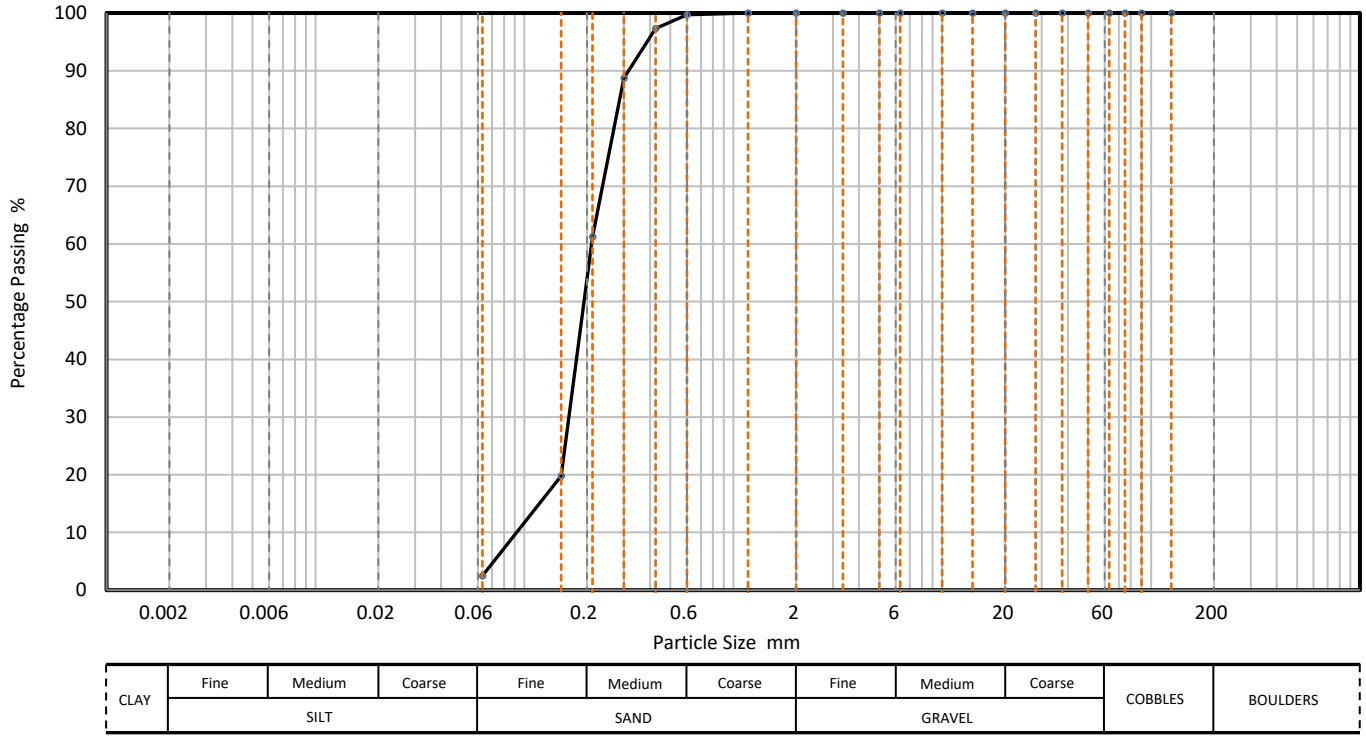
info@g2mtesting.co.uk

UKAS TESTING
10258

Hole	BHSP06	Lab sample ID	G2MT2023062736
Depth (Top) m	34.50	Test Method	BS 1377 - 2 : 1990 Clause 9.2
Depth (Base) m		Soil Description	Slightly Silty, SAND
Sample type	B		



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	100		
6.3	100		
5	100		
3.35	100		
2	100		
1.18	100		
0.6	100		
0.425	97		
0.3	89		
0.212	61		
0.15	20		
0.063	3		

Dry Mass of sample, g: 1019

Sample Proportions	% dry mass
Very coarse	0.0
Gravel	0.0
Sand	97.5
Fines <0.063mm	2.0

Grading Analysis		
D100	mm	
D60	mm	0.21
D30	mm	0.163
D10	mm	0.0918
Uniformity Coefficient		2.3
Curvature Coefficient		1.4

Remarks
Preparation and testing in accordance with test method unless noted below

Accreditation status
Hydrometer is the usual Sedimentation method carried out by G2M Testing and is part of the G2M Testing UKAS accreditation schedule.

Approved by	D Anderson
Approval date	30/06/2023 13:06

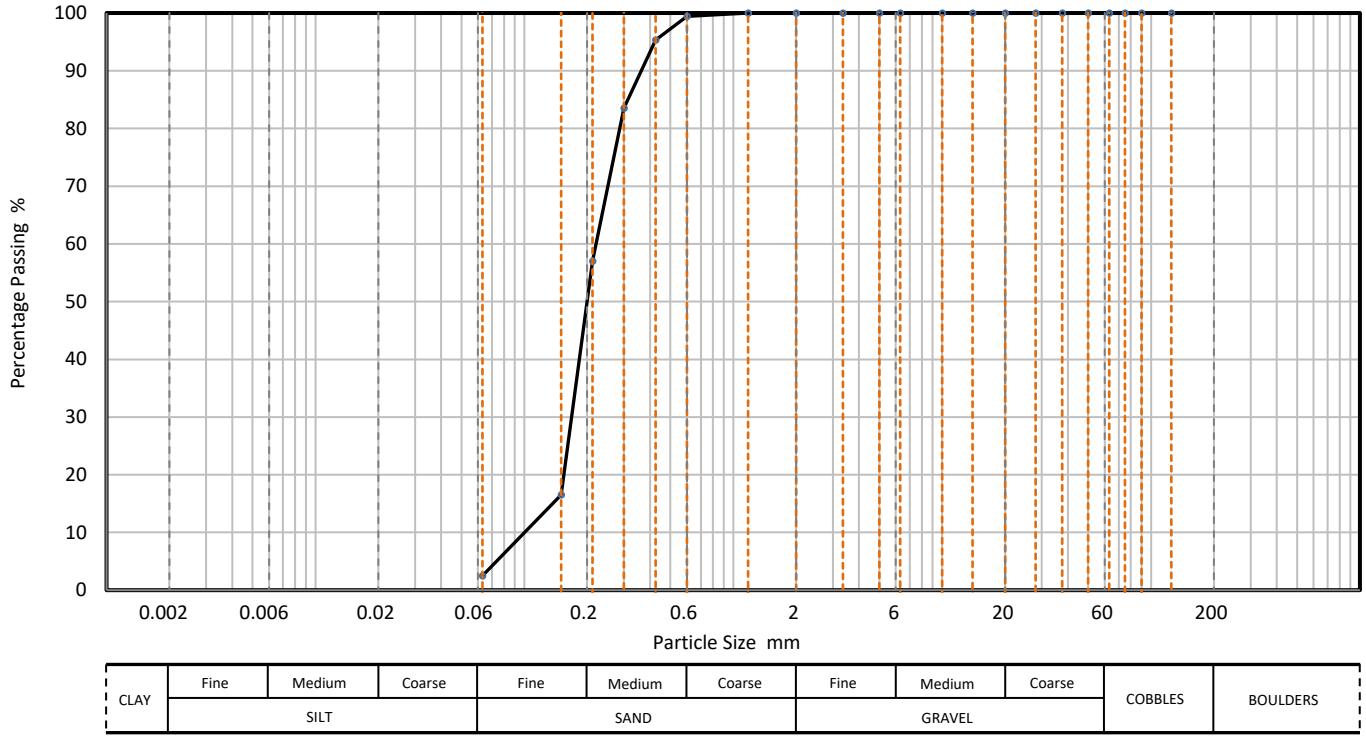
PARTICLE SIZE DISTRIBUTION

Site name	Job number
Ardersier Port	S230503

G2M Testing (Stockton)
12-16 Yarm Road,
Stockton on Tees,
TS18 3NA
01642 033318
info@g2mtesting.co.uk

UKAS TESTING
10258

Hole	BHSP06	Lab sample ID	G2MT2023062737
Depth (Top) m	36.00	Test Method	BS 1377 - 2 : 1990 Clause 9.2
Depth (Base) m		Soil Description	Slightly Silty, SAND
Sample type	B		



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	100		
6.3	100		
5	100		
3.35	100		
2	100		
1.18	100		
0.6	99		
0.425	95		
0.3	84		
0.212	57		
0.15	17		
0.063	3		

Dry Mass of sample, g: 1219

Sample Proportions	% dry mass
Very coarse	0.0
Gravel	0.0
Sand	97.5
Fines <0.063mm	2.0

Grading Analysis		
D100	mm	
D60	mm	0.22
D30	mm	0.168
D10	mm	0.1
Uniformity Coefficient		2.2
Curvature Coefficient		1.3

Remarks
Preparation and testing in accordance with test method unless noted below

Accreditation status
Hydrometer is the usual Sedimentation method carried out by G2M Testing and is part of the G2M Testing UKAS accreditation schedule.

Approved by	D Anderson
Approval date	30/06/2023 10:19

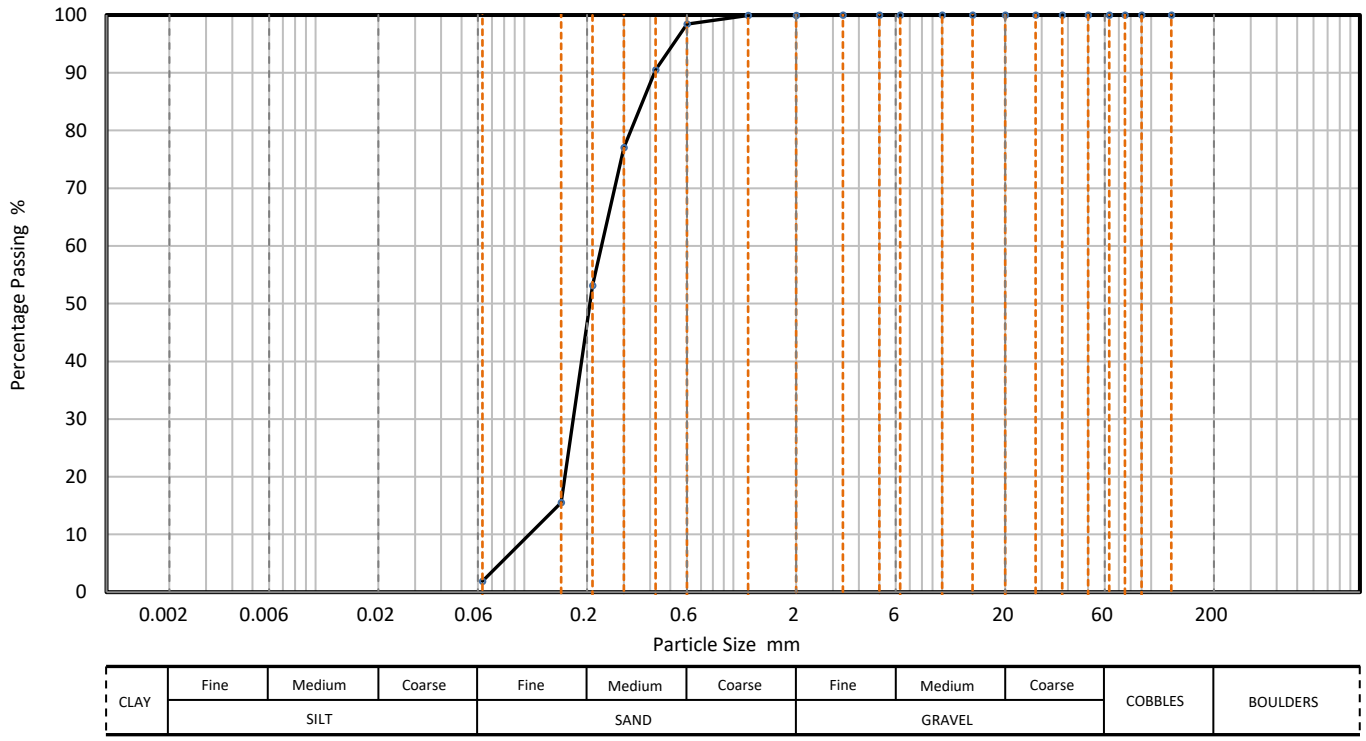
PARTICLE SIZE DISTRIBUTION

Site name	Job number
Ardersier Port	S230503

G2M Testing (Stockton)
12-16 Yarm Road,
Stockton on Tees,
TS18 3NA
01642 033318
info@g2mtesting.co.uk

UKAS TESTING
10258

Hole	BHSP06	Lab sample ID	G2MT2023062738
Depth (Top) m	39.00	Test Method	BS 1377 - 2 : 1990 Clause 9.2
Depth (Base) m		Soil Description	Very slightly Gravelly, slightly Silty, SAND
Sample type	D		



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	100		
6.3	100		
5	100		
3.35	100		
2	100		
1.18	100		
0.6	98		
0.425	91		
0.3	77		
0.212	53		
0.15	16		
0.063	2		

Dry Mass of sample, g: 503

Sample Proportions	% dry mass
Very coarse	0.0
Gravel	0.1
Sand	98.1
Fines <0.063mm	2.0

Grading Analysis		
D100	mm	
D60	mm	0.234
D30	mm	0.171
D10	mm	0.106
Uniformity Coefficient		2.2
Curvature Coefficient		1.2

Remarks
Preparation and testing in accordance with test method unless noted below

Accreditation status
Hydrometer is the usual Sedimentation method carried out by G2M Testing and is part of the G2M Testing UKAS accreditation schedule.

Approved by	D Anderson
Approval date	30/06/2023 13:08

Laboratory Report Front Sheet

Site name	Job number
Ardersier Port	S230503

G2M Testing (Stockton)
12-16 Yarm Road,
Stockton on Tees,
TS18 3NA
01642 033318
info@g2mtesting.co.uk

UKAS TESTING
10258

Client details:

Reference:	S230503
Name:	Solmek
Address:	12 Yarm Road, Stockton-on-tees, TS18 3NA
Telephone:	01642 607083
Email:	acutts@solmek.com
FAO:	Adrian Cutts

Samples received:

Date commenced: 14/07/2023

Date reported: 20/07/2023

Observations and interpretations are outside of the UKAS Accreditiation

A copy of the Laboratory Schedule of accredited tests as issued by UKAS is attached to this report. This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This certificate shall not be reproduced in full, without the prior written approval of the laboratory.

Samples will be held at the laboratory for a period of 4 weeks after the report date. After the above reporting date the samples will be disposed of. Should further testing be required then the office should be informed before the above date.

Signature:	Approved Signitories:
J.Brischuk.	☐ D.Anderson (Managing Director) ☑ J. Brischuk (Laboratory Manager) ☐

Summary of Classification Tests

G2M Testing (Stockton)
12-16 Yarm Road,
Stockton on Tees,
TS18 3NA
01642 033318
info@g2mtesting.co.uk

UKAS TESTING

10258

Site name	Job number
Ardersier Port	S230503

Hole	Depth Top m	Depth Base m	Type	*w* %	Oven temp. oc	wa %	Pa %	Pr %	wL %	wP %	IP %	IL	Plasticity class	Preparation method
BHSP07	0.70		B	20	105									
BHSP07	2.00		B	19	105									
BHSP07	4.00		B	19	105									
BHSP07	6.00		B	17	105									
BHSP07	8.00		B	7.6	105									
BHSP07	10.10		B	18	105									
BHSP07	13.50		B	19	105									
BHSP07	16.50		B	20	105									
BHSP07	19.50		B	21	105									
BHSP07	22.50		B	21	105									
BHSP07	25.50		B	21	105									
BHSP07	28.50		B	20	105									
BHSP07	31.50		B	18	105									
BHSP07	34.50		B	19	105									

All tests found in G2M Testing UKAS Schedule of Accreditation are tested to standard unless otherwise indicated

Key	Description		Category	BS Test Code
w	Moisture content			BS 1377:1990 Part 2 Clause 3.2
wa	Equivalent moisture content passing 425µm sieve			BS 1377:1990 Part 2 Clause 3.2
wL	Liquid limit	Single point	-s	BS 1377:1990 Part 2 Clause 4.4
		Four point	-f	BS 1377:1990 Part 2 Clause 4.3
wP	Plastic limit			BS 1377:1990 Part 2 Clause 5.2
Pa	Percentage passing 425um sieve			
Pr	Percentage retained 425um sieve			
IP	Plasticity index			BS 1377:1990 Part 2 Clause 5.4
IL	Liquidity index			BS 1377:1990 Part 2 Clause 5.4
	Suffix indicating test is "Not UKAS Accredited"		*	

Approved by	JBrischuk
Approval date	20/07/2023 14:09
Date report generated	
Report Number	

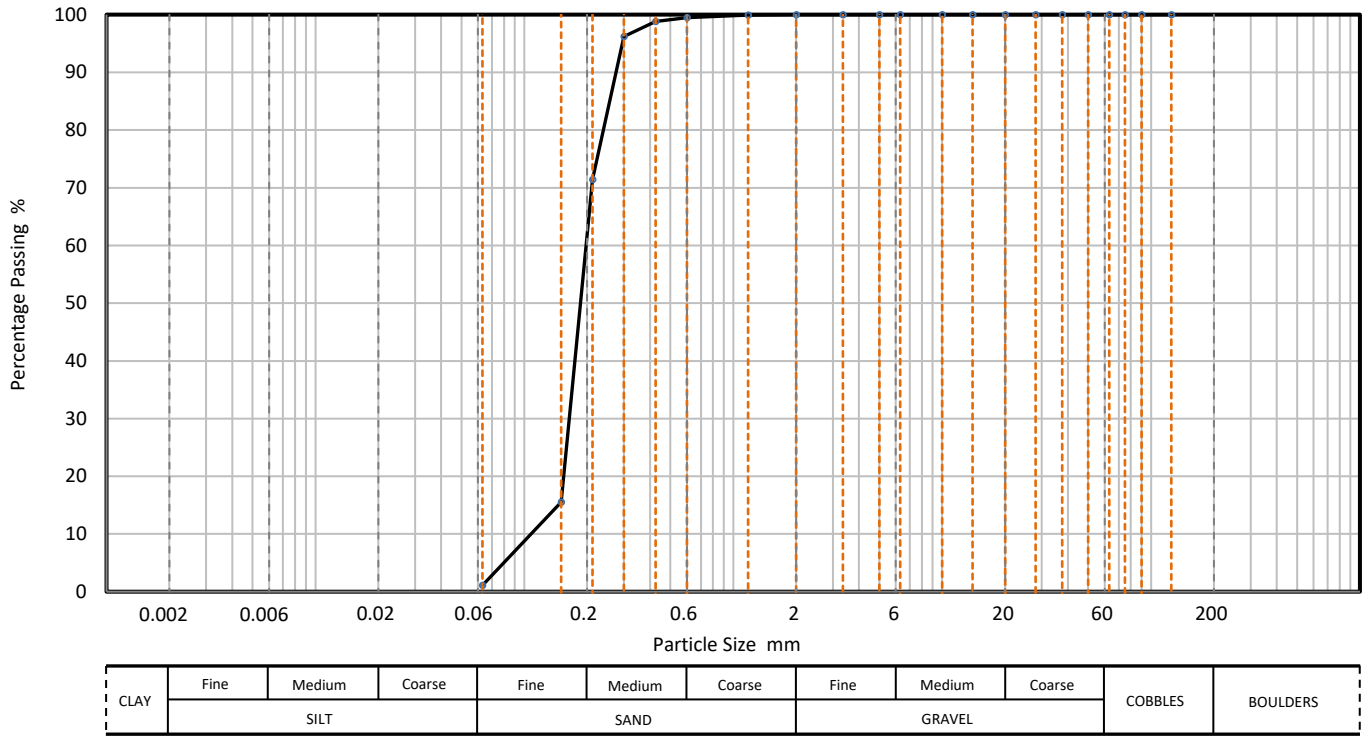
PARTICLE SIZE DISTRIBUTION

Site name	Job number
Ardersier Port	S230503

G2M Testing (Stockton)
12-16 Yarm Road,
Stockton on Tees,
TS18 3NA
01642 033318
info@g2mtesting.co.uk

UKAS TESTING
10258

Hole	BHSP07	Lab sample ID	G2MT2023071492
Depth (Top) m	0.70	Test Method	BS 1377 - 2 : 1990 Clause 9.2
Depth (Base) m		Soil Description	Slightly Clayey SAND
Sample type	B		



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	100		
6.3	100		
5	100		
3.35	100		
2	100		
1.18	100		
0.6	100		
0.425	99		
0.3	96		
0.212	71		
0.15	16		
0.063	1		

Dry Mass of sample, g: 497

Sample Proportions	% dry mass
Very coarse	0.0
Gravel	0.0
Sand	98.9
Fines <0.063mm	1.0

Grading Analysis		
D100	mm	
D60	mm	0.198
D30	mm	0.164
D10	mm	0.108
Uniformity Coefficient		1.8
Curvature Coefficient		1.3

Remarks
Preparation and testing in accordance with test method unless noted below

Accreditation status
Hydrometer is the usual Sedimentation method carried out by G2M Testing and is part of the G2M Testing UKAS accreditation schedule.

Approved by	JBrischuk
Approval date	20/07/2023 14:37

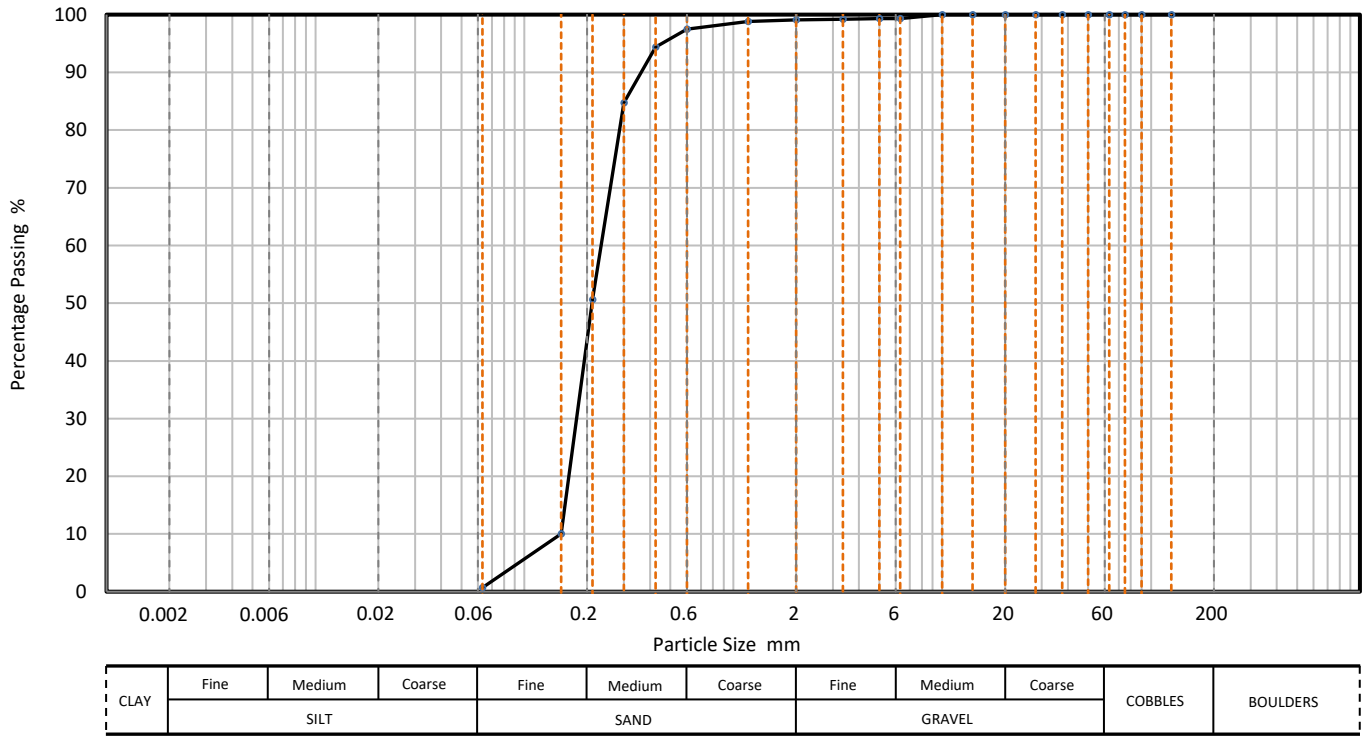
PARTICLE SIZE DISTRIBUTION

Site name	Job number
Ardersier Port	S230503

G2M Testing (Stockton)
12-16 Yarm Road,
Stockton on Tees,
TS18 3NA
01642 033318
info@g2mtesting.co.uk

UKAS TESTING
10258

Hole	BHSP07	Lab sample ID	G2MT2023071493
Depth (Top) m	2.00	Test Method	BS 1377 - 2 : 1990 Clause 9.2
Depth (Base) m		Soil Description	Slightly Gravelly, Slightly Clayey, SAND
Sample type	B		



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	100		
6.3	99		
5	99		
3.35	99		
2	99		
1.18	99		
0.6	98		
0.425	94		
0.3	85		
0.212	51		
0.15	10		
0.063	1		

Dry Mass of sample, g	434

Sample Proportions	% dry mass
Very coarse	0.0
Gravel	0.9
Sand	98.4
Fines <0.063mm	1.0

Grading Analysis		
D100	mm	
D60	mm	0.233
D30	mm	0.178
D10	mm	0.15
Uniformity Coefficient		1.6
Curvature Coefficient		0.9

Remarks
Preparation and testing in accordance with test method unless noted below

Accreditation status
Hydrometer is the usual Sedimentation method carried out by G2M Testing and is part of the G2M Testing UKAS accreditation schedule.

Approved by	JBrischuk
Approval date	20/07/2023 14:37

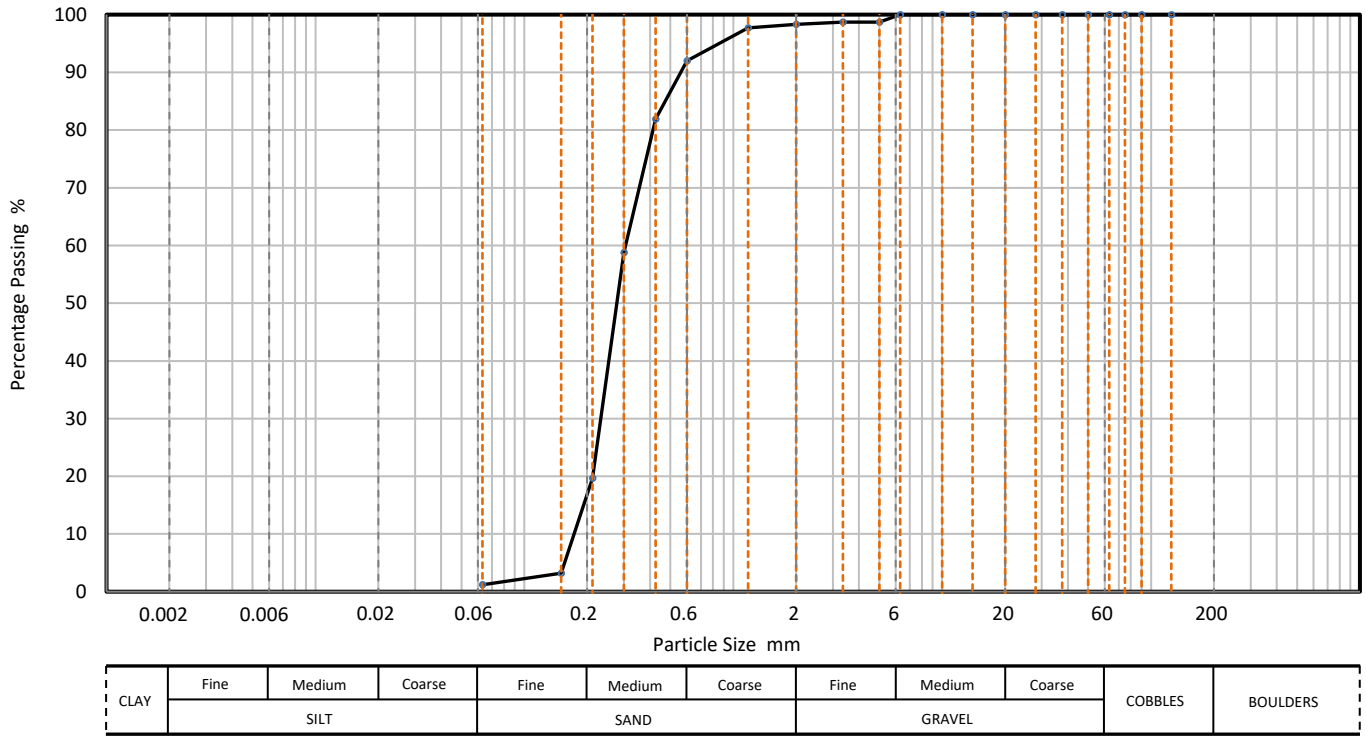
PARTICLE SIZE DISTRIBUTION

Site name	Job number
Ardersier Port	S230503

G2M Testing (Stockton)
12-16 Yarm Road,
Stockton on Tees,
TS18 3NA
01642 033318
info@g2mtesting.co.uk

UKAS TESTING
10258

Hole	BHSP07	Lab sample ID	G2MT2023071494
Depth (Top) m	4.00	Test Method	BS 1377 - 2 : 1990 Clause 9.2
Depth (Base) m		Soil Description	Slighlty Clayey, Slightly Gravelly, SAND
Sample type	B		



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	100		
6.3	100		
5	99		
3.35	99		
2	98		
1.18	98		
0.6	92		
0.425	82		
0.3	59		
0.212	20		
0.15	3		
0.063	1		

Dry Mass of sample, g: 911

Sample Proportions	% dry mass
Very coarse	0.0
Gravel	1.7
Sand	97.1
Fines <0.063mm	1.0

Grading Analysis		
D100	mm	
D60	mm	0.306
D30	mm	0.232
D10	mm	0.173
Uniformity Coefficient		1.8
Curvature Coefficient		1

Remarks
Preparation and testing in accordance with test method unless noted below

Accreditation status
Hydrometer is the usual Sedimentation method carried out by G2M Testing and is part of the G2M Testing UKAS accreditation schedule.

Approved by	JBrischuk
Approval date	20/07/2023 14:37

PARTICLE SIZE DISTRIBUTION

Site name	Job number
Ardersier Port	S230503

G2M Testing (Stockton)
12-16 Yarm Road,
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TS18 3NA
01642 033318
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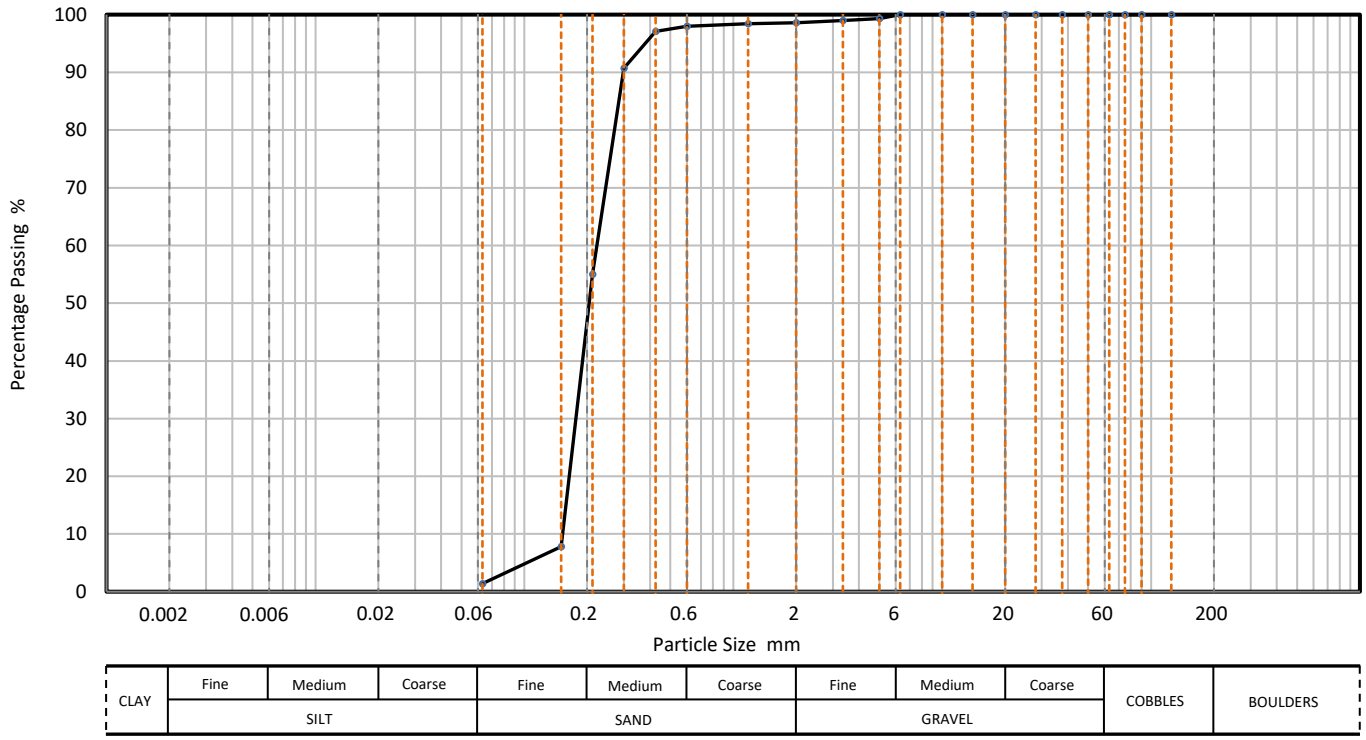
UKAS TESTING
10258

Hole	BHSP07	Lab sample ID	G2MT2023071495
Depth (Top) m	6.00	Test Method	BS 1377 - 2 : 1990 Clause 9.2
Depth (Base) m		Soil Description	Slightly Clayey, Slightly Gravelly, SAND
Sample type	B		



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	100		
6.3	100		
5	99		
3.35	99		
2	99		
1.18	98		
0.6	98		
0.425	97		
0.3	91		
0.212	55		
0.15	8		
0.063	1		

Dry Mass of sample, g	429

Sample Proportions	% dry mass
Very coarse	0.0
Gravel	1.4
Sand	97.2
Fines <0.063mm	1.0

Grading Analysis		
D100	mm	
D60	mm	0.223
D30	mm	0.177
D10	mm	0.152
Uniformity Coefficient		1.5
Curvature Coefficient		0.92

Remarks
Preparation and testing in accordance with test method unless noted below

Accreditation status
Hydrometer is the usual Sedimentation method carried out by G2M Testing and is part of the G2M Testing UKAS accreditation schedule.

Approved by	JBrischuk
Approval date	20/07/2023 14:37

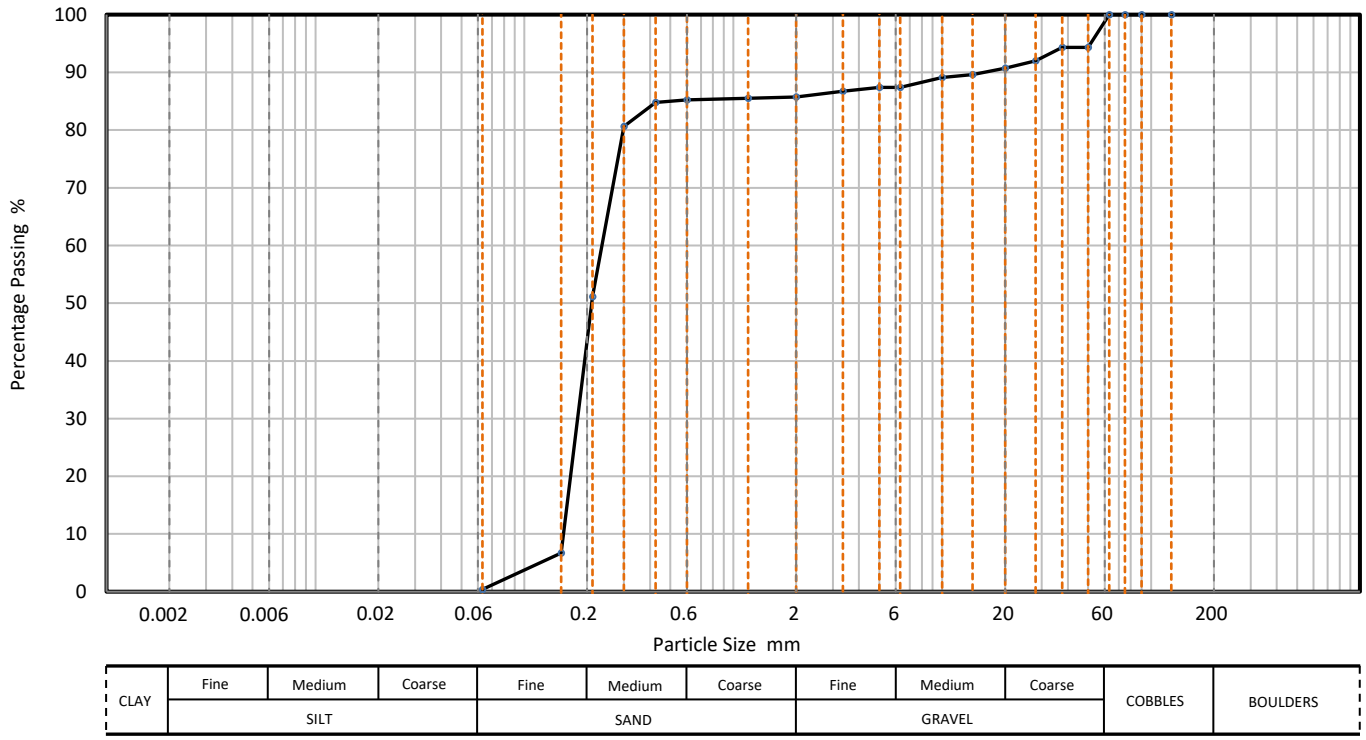
PARTICLE SIZE DISTRIBUTION

Site name	Job number
Ardersier Port	S230503

G2M Testing (Stockton)
12-16 Yarm Road,
Stockton on Tees,
TS18 3NA
01642 033318
info@g2mtesting.co.uk

UKAS TESTING
10258

Hole	BHSP07	Lab sample ID	G2MT2023071496
Depth (Top) m	8.00	Test Method	BS 1377 - 2 : 1990 Clause 9.2
Depth (Base) m		Soil Description	Gravelly SAND
Sample type	B		



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	94		
37.5	94		
28	92		
20	91		
14	90		
10	89		
6.3	87		
5	87		
3.35	87		
2	86		
1.18	86		
0.6	85		
0.425	85		
0.3	81		
0.212	51		
0.15	7		
0.063	0		

Dry Mass of sample, g: 6819

Sample Proportions	% dry mass
Very coarse	0.0
Gravel	14.3
Sand	85.3
Fines <0.063mm	0.0

Grading Analysis		
D100	mm	
D60	mm	0.235
D30	mm	0.18
D10	mm	0.154
Uniformity Coefficient		1.5
Curvature Coefficient		0.89

Remarks
Preparation and testing in accordance with test method unless noted below

Accreditation status
Hydrometer is the usual Sedimentation method carried out by G2M Testing and is part of the G2M Testing UKAS accreditation schedule.

Approved by	JBrischuk
Approval date	20/07/2023 14:37

PARTICLE SIZE DISTRIBUTION

Site name	Job number
Ardersier Port	S230503

G2M Testing (Stockton)
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Stockton on Tees,
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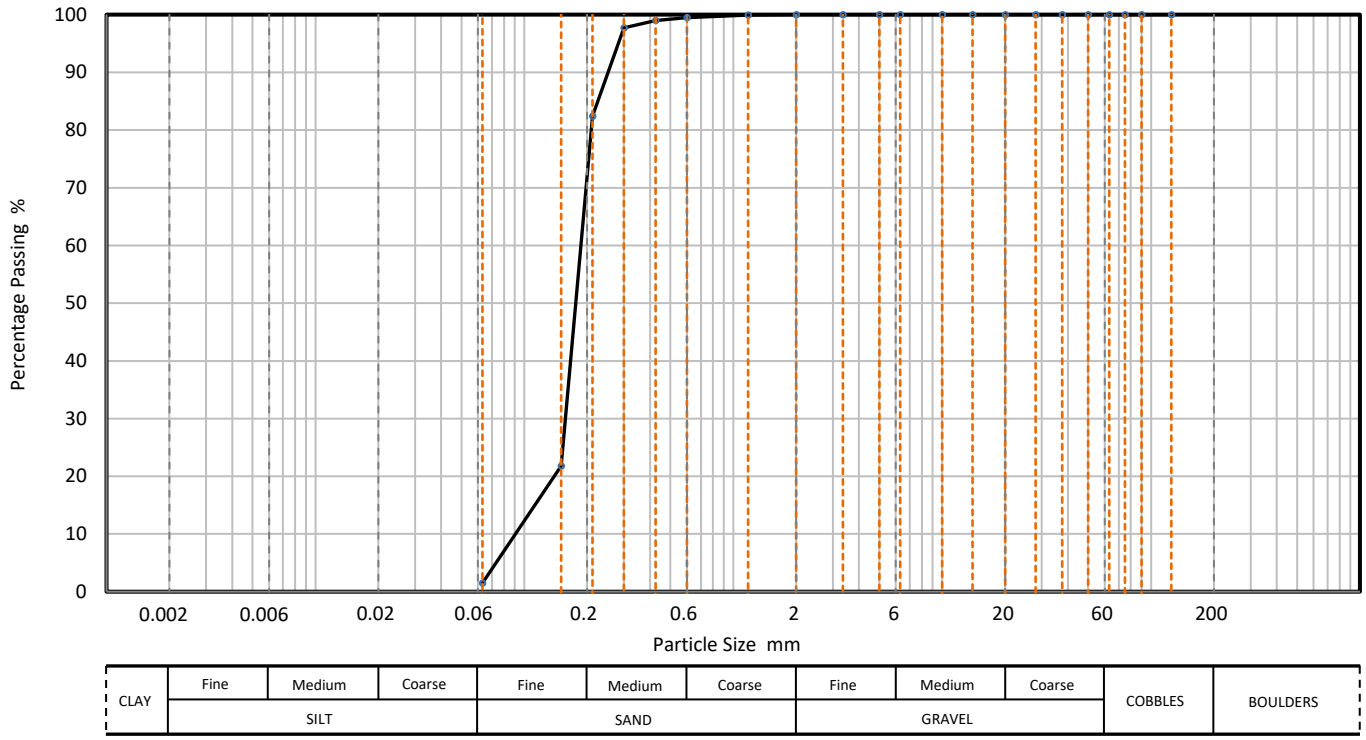
Hole		BHSP07	Lab sample ID	G2MT2023071497
Depth (Top)	m	10.10	Test Method	BS 1377 - 2 : 1990 Clause 9.2
Depth (Base)	m		Soil Description	Slighlty Clayey SAND
Sample type		B		



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	100		
6.3	100		
5	100		
3.35	100		
2	100		
1.18	100		
0.6	100		
0.425	99		
0.3	98		
0.212	82		
0.15	22		
0.063	2		

Dry Mass of sample, g	539

Sample Proportions	% dry mass
Very coarse	0.0
Gravel	0.0
Sand	98.5
Fines <0.063mm	2.0

Grading Analysis		
D100	mm	
D60	mm	0.187
D30	mm	0.157
D10	mm	0.0905
Uniformity Coefficient		2.1
Curvature Coefficient		1.5

Remarks
Preparation and testing in accordance with test method unless noted below

Accreditation status
Hydrometer is the usual Sedimentation method carried out by G2M Testing and is part of the G2M Testing UKAS accreditation schedule.

Approved by	JBrischuk
Approval date	20/07/2023 14:37

PARTICLE SIZE DISTRIBUTION

Site name	Job number
Ardersier Port	S230503

G2M Testing (Stockton)
12-16 Yarm Road,
Stockton on Tees,
TS18 3NA
01642 033318
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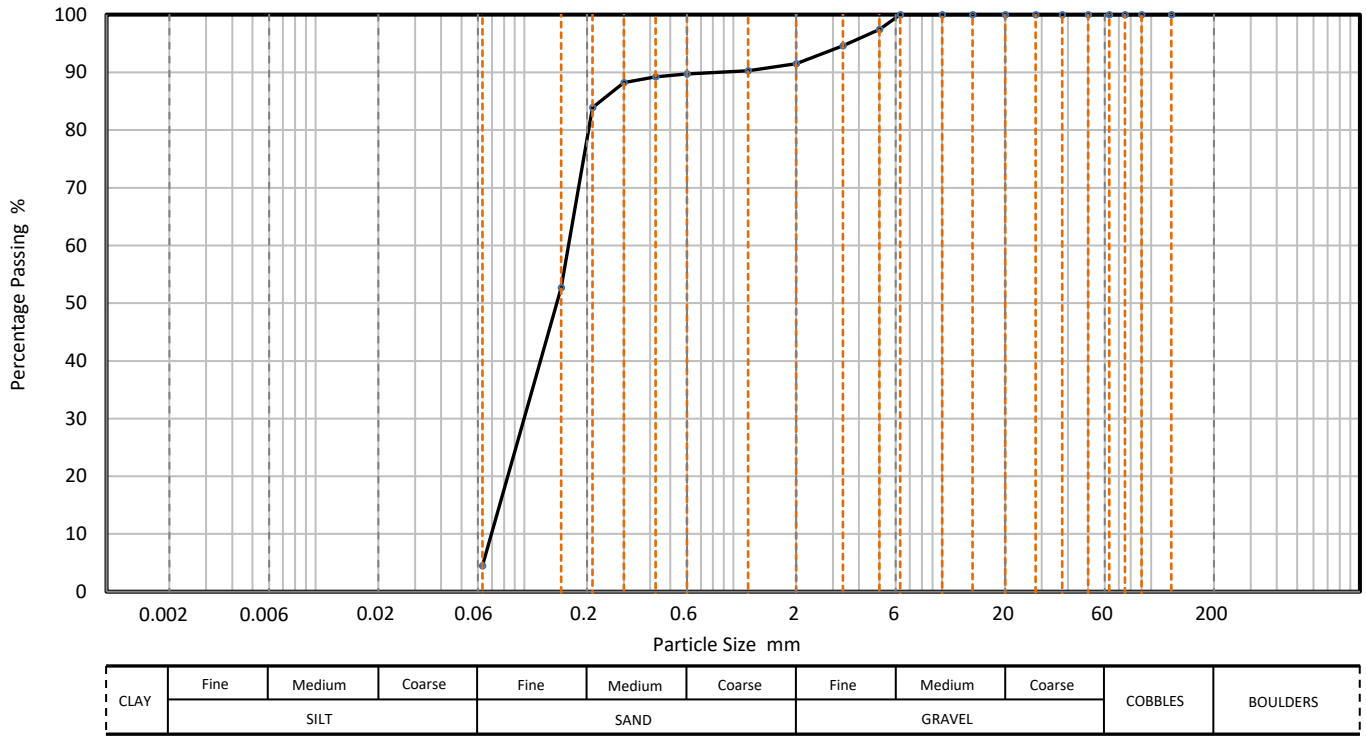
UKAS TESTING
10258

Hole	BHSP07	Lab sample ID	G2MT2023071498
Depth (Top) m	13.50	Test Method	BS 1377 - 2 : 1990 Clause 9.2
Depth (Base) m		Soil Description	Slighlty Clayey, Gravelly SAND
Sample type	B		



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	100		
6.3	100		
5	97		
3.35	95		
2	92		
1.18	90		
0.6	90		
0.425	89		
0.3	88		
0.212	84		
0.15	53		
0.063	5		

Dry Mass of sample, g: 458

Sample Proportions	% dry mass
Very coarse	0.0
Gravel	8.5
Sand	87.0
Fines <0.063mm	4.0

Grading Analysis		
D100	mm	
D60	mm	0.163
D30	mm	0.0997
D10	mm	0.0696
Uniformity Coefficient		2.3
Curvature Coefficient		0.88

Remarks
Preparation and testing in accordance with test method unless noted below

Accreditation status
Hydrometer is the usual Sedimentation method carried out by G2M Testing and is part of the G2M Testing UKAS accreditation schedule.

Approved by	JBrischuk
Approval date	20/07/2023 14:37

PARTICLE SIZE DISTRIBUTION

Site name	Job number
Ardersier Port	S230503

G2M Testing (Stockton)
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Stockton on Tees,
TS18 3NA
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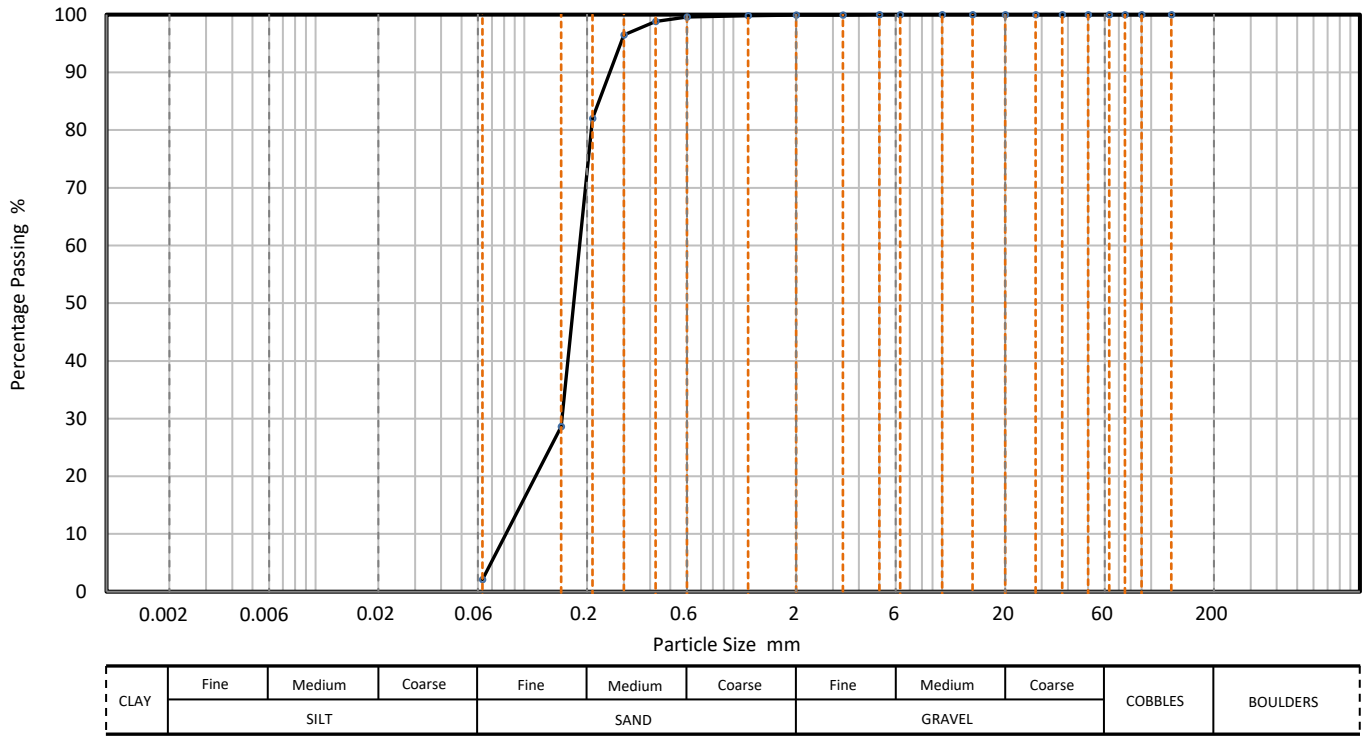
UKAS TESTING
10258

Hole	BHSP07	Lab sample ID	G2MT2023071499
Depth (Top) m	16.50	Test Method	BS 1377 - 2 : 1990 Clause 9.2
Depth (Base) m		Soil Description	Slightly Gravelly, Slightly Clayey, SAND
Sample type	B		



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	100		
6.3	100		
5	100		
3.35	100		
2	100		
1.18	100		
0.6	100		
0.425	99		
0.3	97		
0.212	82		
0.15	29		
0.063	2		

Dry Mass of sample, g: 437

Sample Proportions	% dry mass
Very coarse	0.0
Gravel	0.1
Sand	97.7
Fines <0.063mm	2.0

Grading Analysis		
D100	mm	
D60	mm	0.184
D30	mm	0.151
D10	mm	0.0815
Uniformity Coefficient		2.3
Curvature Coefficient		1.5

Remarks
Preparation and testing in accordance with test method unless noted below

Accreditation status
Hydrometer is the usual Sedimentation method carried out by G2M Testing and is part of the G2M Testing UKAS accreditation schedule.

Approved by	JBrischuk
Approval date	20/07/2023 14:37

PARTICLE SIZE DISTRIBUTION

Site name	Job number
Ardersier Port	S230503

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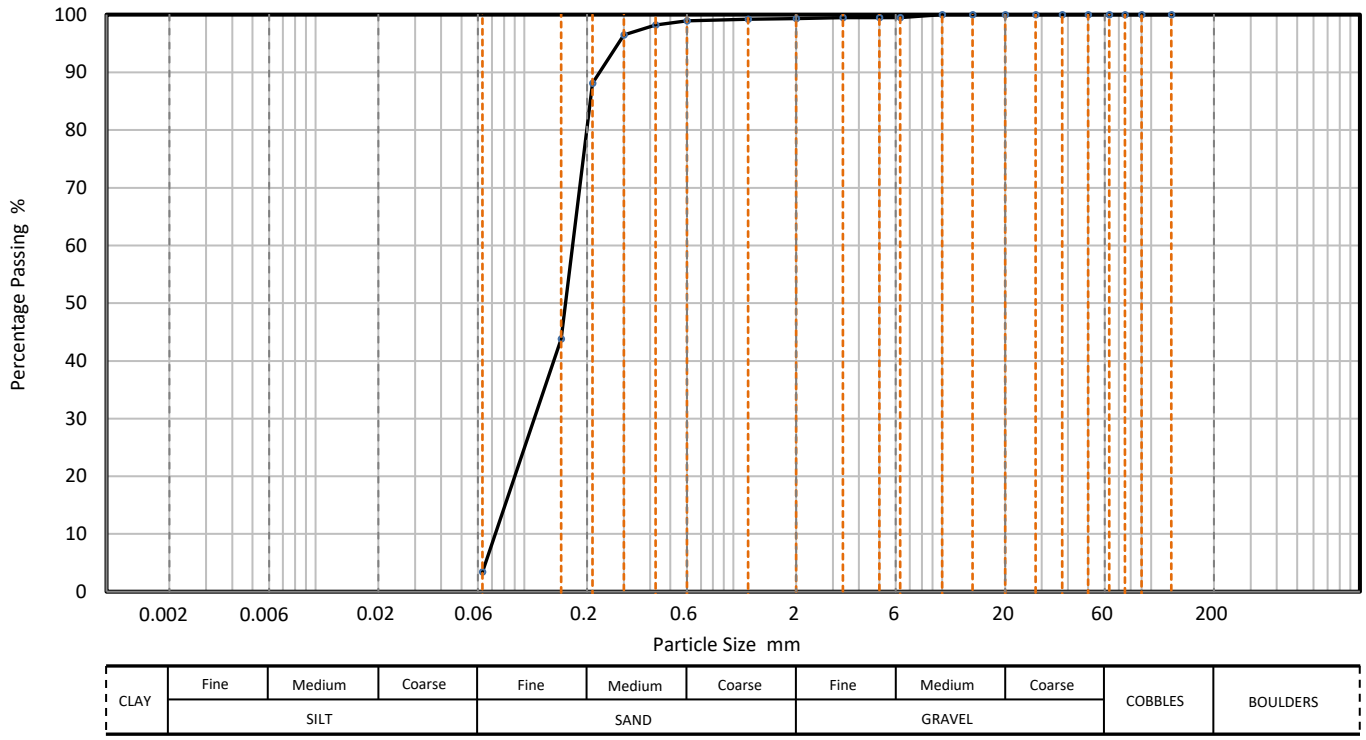
10258

Hole	BHSP07	Lab sample ID	G2MT20230714100
Depth (Top) m	19.50	Test Method	BS 1377 - 2 : 1990 Clause 9.2
Depth (Base) m		Soil Description	Slightly Gravelly, Slightly Clayey SAND
Sample type	B		



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	100		
6.3	100		
5	100		
3.35	100		
2	99		
1.18	99		
0.6	99		
0.425	98		
0.3	97		
0.212	88		
0.15	44		
0.063	3		

Dry Mass of sample, g	854

Sample Proportions	% dry mass
Very coarse	0.0
Gravel	0.7
Sand	95.9
Fines <0.063mm	3.0

Grading Analysis		
D100	mm	
D60	mm	0.17
D30	mm	0.111
D10	mm	0.0725
Uniformity Coefficient		2.3
Curvature Coefficient		1

Remarks
Preparation and testing in accordance with test method unless noted below

Accreditation status
Hydrometer is the usual Sedimentation method carried out by G2M Testing and is part of the G2M Testing UKAS accreditation schedule.

Approved by	JBrischuk
Approval date	20/07/2023 14:37

PARTICLE SIZE DISTRIBUTION

Site name	Job number
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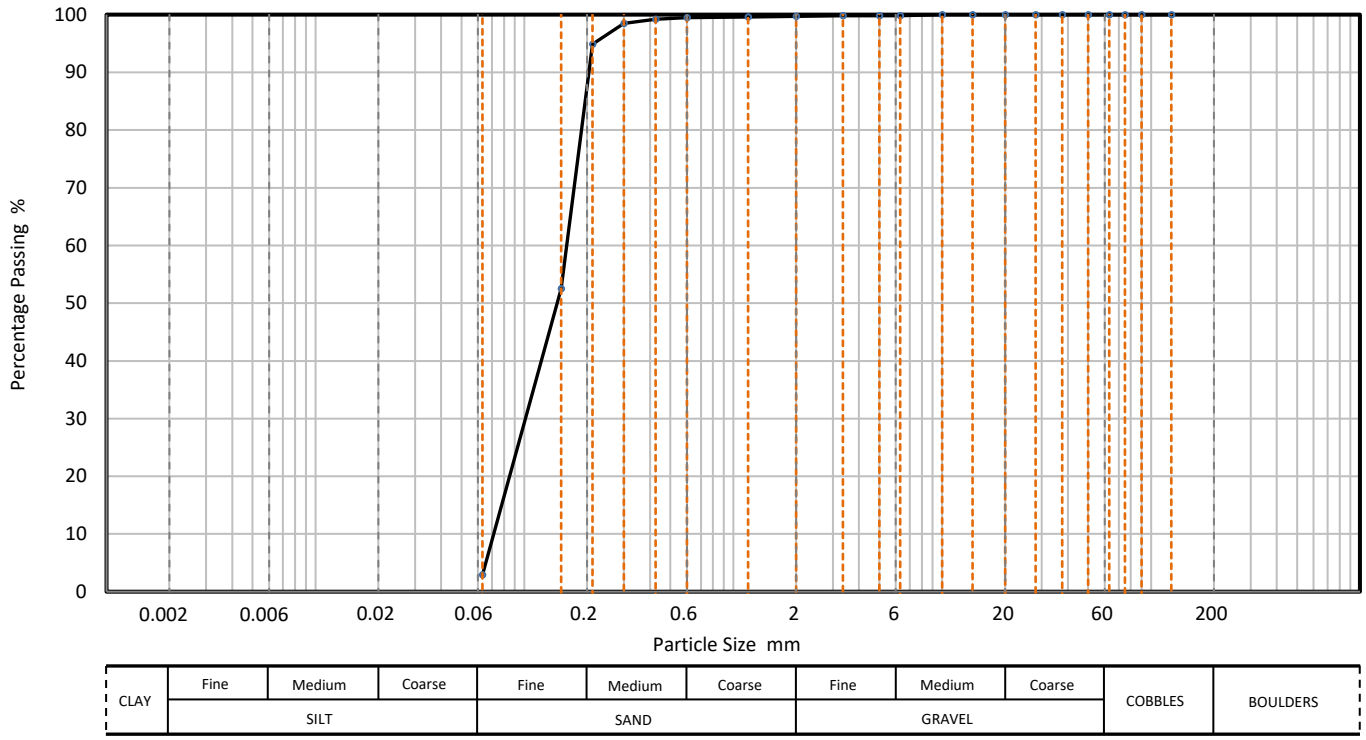
Hole		BHSP07	Lab sample ID	G2MT20230714101
Depth (Top)	m	22.50	Test Method	BS 1377 - 2 : 1990 Clause 9.2
Depth (Base)	m		Soil Description	Slightly Gravelly, Slightly Clayey SAND
Sample type		B		



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	100		
6.3	100		
5	100		
3.35	100		
2	100		
1.18	100		
0.6	100		
0.425	99		
0.3	99		
0.212	95		
0.15	53		
0.063	3		

Dry Mass of sample, g	449

Sample Proportions	% dry mass
Very coarse	0.0
Gravel	0.3
Sand	96.8
Fines <0.063mm	3.0

Grading Analysis		
D100	mm	
D60	mm	0.159
D30	mm	0.101
D10	mm	0.0713
Uniformity Coefficient		2.2
Curvature Coefficient		0.9

Remarks
Preparation and testing in accordance with test method unless noted below

Accreditation status
Hydrometer is the usual Sedimentation method carried out by G2M Testing and is part of the G2M Testing UKAS accreditation schedule.

Approved by	JBrischuk
Approval date	20/07/2023 14:37

PARTICLE SIZE DISTRIBUTION

Site name	Job number
Ardersier Port	S230503

G2M Testing (Stockton)
12-16 Yarm Road,
Stockton on Tees,
TS18 3NA
01642 033318
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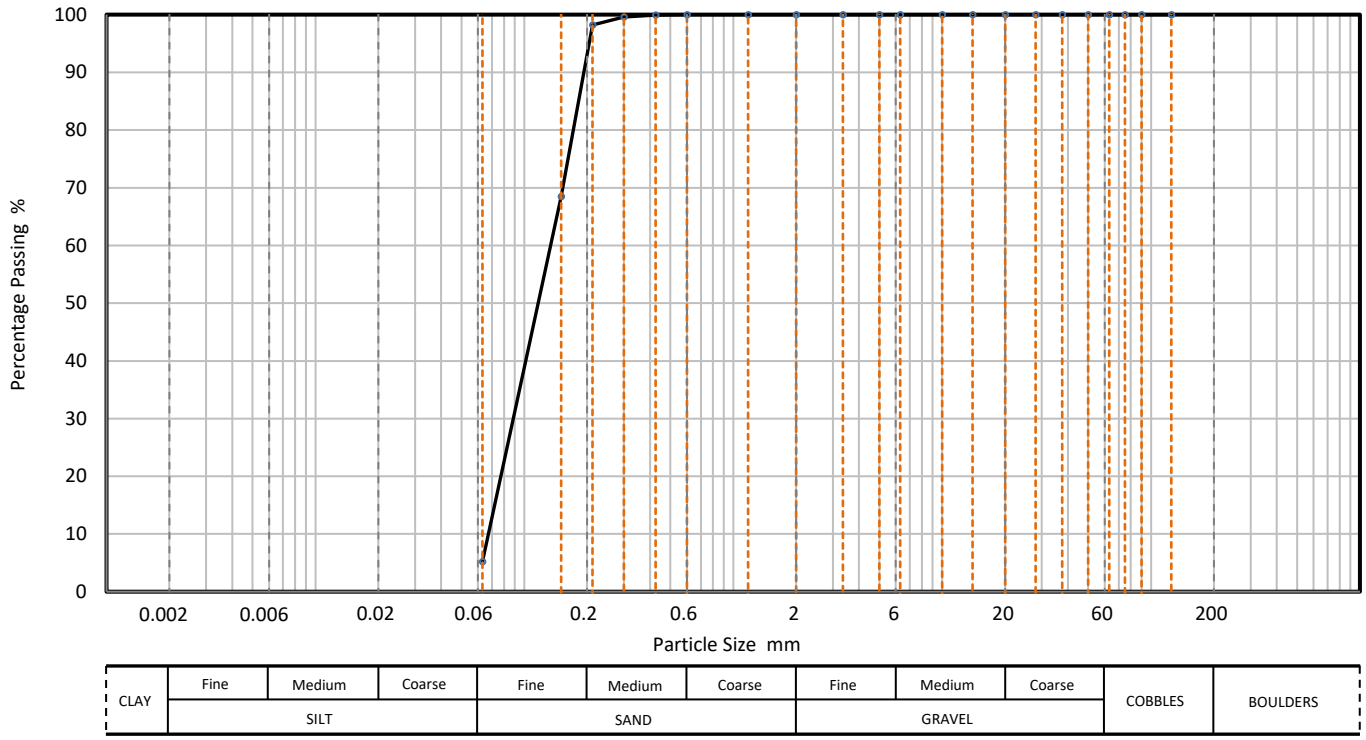
10258

Hole	BHSP07	Lab sample ID	G2MT20230714102
Depth (Top) m	25.50	Test Method	BS 1377 - 2 : 1990 Clause 9.2
Depth (Base) m		Soil Description	Slighlty Clayey SAND
Sample type	B		



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	100		
6.3	100		
5	100		
3.35	100		
2	100		
1.18	100		
0.6	100		
0.425	100		
0.3	100		
0.212	98		
0.15	69		
0.063	5		

Dry Mass of sample, g	443

Sample Proportions	% dry mass
Very coarse	0.0
Gravel	0.0
Sand	94.8
Fines <0.063mm	5.0

Grading Analysis		
D100	mm	
D60	mm	0.134
D30	mm	0.0885
D10	mm	0.0673
Uniformity Coefficient		2
Curvature Coefficient		0.87

Remarks
Preparation and testing in accordance with test method unless noted below

Accreditation status
Hydrometer is the usual Sedimentation method carried out by G2M Testing and is part of the G2M Testing UKAS accreditation schedule.

Approved by	JBrischuk
Approval date	20/07/2023 14:37

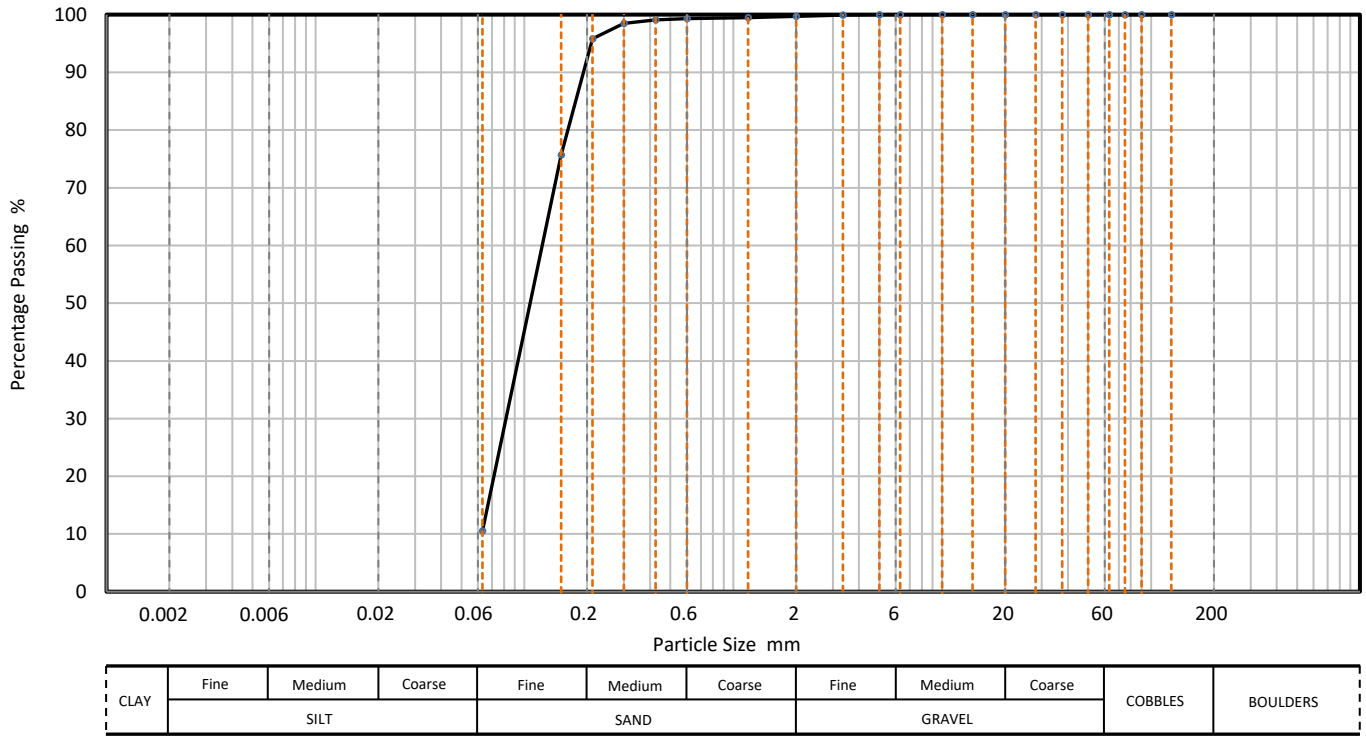
PARTICLE SIZE DISTRIBUTION

Site name	Job number
Ardersier Port	S230503

G2M Testing (Stockton)
12-16 Yarm Road,
Stockton on Tees,
TS18 3NA
01642 033318
info@g2mtesting.co.uk

UKAS TESTING
10258

Hole	BHSP07	Lab sample ID	G2MT20230714103
Depth (Top) m	28.50	Test Method	BS 1377 - 2 : 1990 Clause 9.2
Depth (Base) m		Soil Description	Slightly Gravelly, Clayey, SAND
Sample type	B		



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	100		
6.3	100		
5	100		
3.35	100		
2	100		
1.18	100		
0.6	99		
0.425	99		
0.3	99		
0.212	96		
0.15	76		
0.063	11		

Dry Mass of sample, g: 428

Sample Proportions	% dry mass
Very coarse	0.0
Gravel	0.3
Sand	89.1
Fines <0.063mm	11.0

Grading Analysis		
D100	mm	
D60	mm	0.122
D30	mm	0.0816
D10	mm	
Uniformity Coefficient		
Curvature Coefficient		

Remarks
Preparation and testing in accordance with test method unless noted below

Accreditation status
Hydrometer is the usual Sedimentation method carried out by G2M Testing and is part of the G2M Testing UKAS accreditation schedule.

Approved by	JBrischuk
Approval date	20/07/2023 14:37

PARTICLE SIZE DISTRIBUTION

Site name	Job number
Ardersier Port	S230503

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Stockton on Tees,
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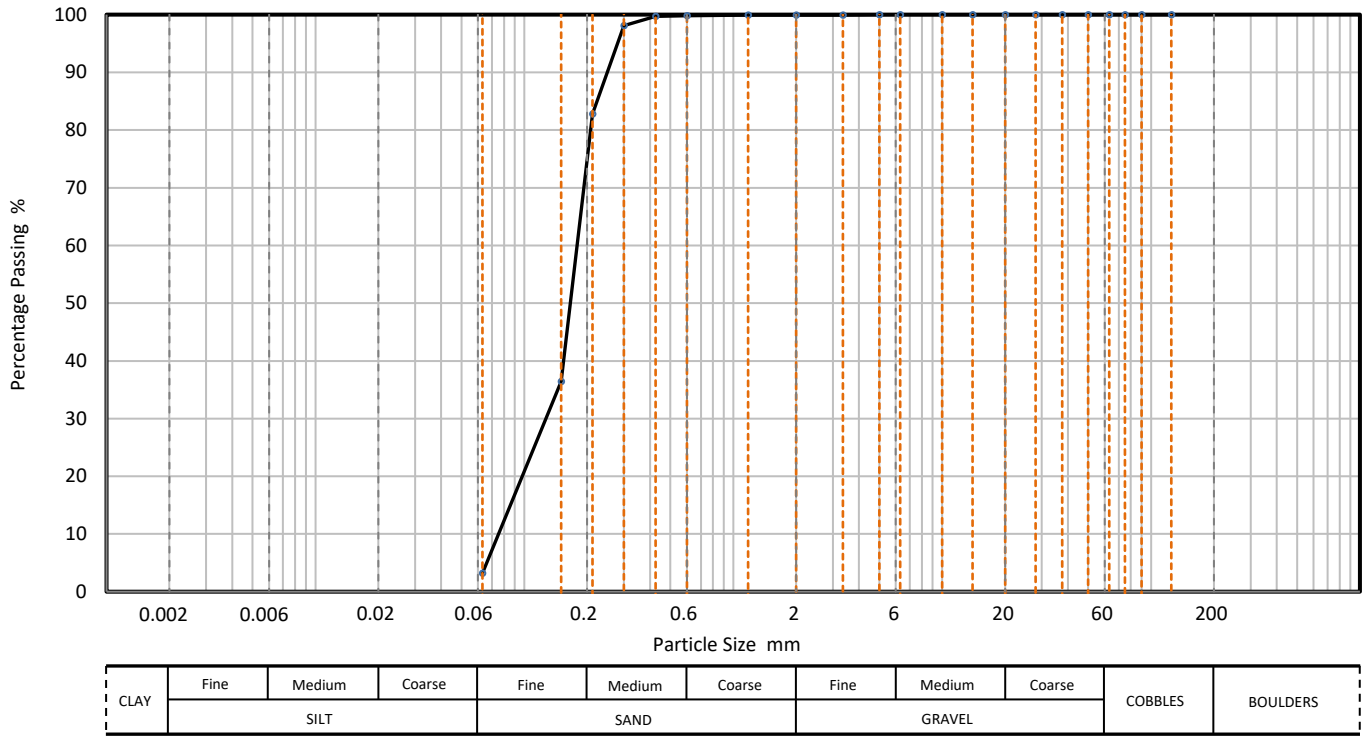
Hole	BHSP07	Lab sample ID	G2MT20230714104
Depth (Top) m	31.50	Test Method	BS 1377 - 2 : 1990 Clause 9.2
Depth (Base) m		Soil Description	Slightly Gravelly, Slightly Clayey SAND
Sample type	B		



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	100		
6.3	100		
5	100		
3.35	100		
2	100		
1.18	100		
0.6	100		
0.425	100		
0.3	98		
0.212	83		
0.15	36		
0.063	3		

Dry Mass of sample, g: 434

Sample Proportions	% dry mass
Very coarse	0.0
Gravel	0.1
Sand	96.7
Fines <0.063mm	3.0

Grading Analysis		
D100	mm	
D60	mm	0.179
D30	mm	0.127
D10	mm	0.0753
Uniformity Coefficient		2.4
Curvature Coefficient		1.2

Remarks
Preparation and testing in accordance with test method unless noted below

Accreditation status
Hydrometer is the usual Sedimentation method carried out by G2M Testing and is part of the G2M Testing UKAS accreditation schedule.

Approved by	JBrischuk
Approval date	20/07/2023 14:37

PARTICLE SIZE DISTRIBUTION

Site name	Job number
Ardersier Port	S230503

G2M Testing (Stockton)
12-16 Yarm Road,
Stockton on Tees,
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01642 033318
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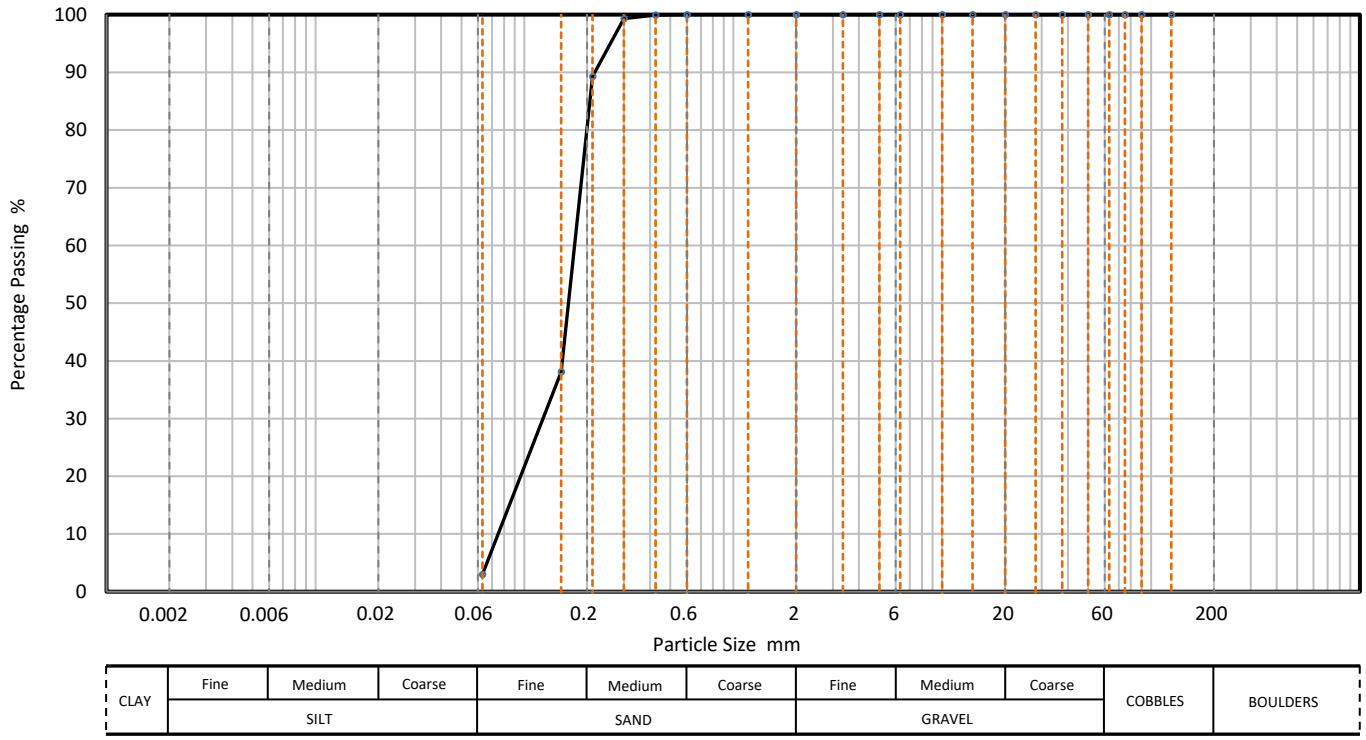
UKAS TESTING
10258

Hole		BHSP07	Lab sample ID	G2MT20230714105
Depth (Top)	m	34.50	Test Method	BS 1377 - 2 : 1990 Clause 9.2
Depth (Base)	m		Soil Description	Slightly Clayey SAND
Sample type		B		



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	100		
6.3	100		
5	100		
3.35	100		
2	100		
1.18	100		
0.6	100		
0.425	100		
0.3	99		
0.212	89		
0.15	38		
0.063	3		

Dry Mass of sample, g	553

Sample Proportions	% dry mass
Very coarse	0.0
Gravel	0.0
Sand	97.0
Fines <0.063mm	3.0

Grading Analysis		
D100	mm	
D60	mm	0.174
D30	mm	0.123
D10	mm	0.0749
Uniformity Coefficient		2.3
Curvature Coefficient		1.2

Remarks
Preparation and testing in accordance with test method unless noted below

Accreditation status
Hydrometer is the usual Sedimentation method carried out by G2M Testing and is part of the G2M Testing UKAS accreditation schedule.

Approved by	JBrischuk
Approval date	20/07/2023 14:37

Laboratory Report Front Sheet

Site name	Job number
Ardersier Port	S230503

G2M Testing (Stockton)
12-16 Yarm Road,
Stockton on Tees,
TS18 3NA
01642 033318
info@g2mtesting.co.uk

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10258

Client details:

Reference:	S230503
Name:	Solmek
Address:	12 Yarm Road, Stockton-on-tees, TS18 3NA
Telephone:	01642 607083
Email:	acutts@solmek.com
FAO:	Adrian Cutts

Samples received:

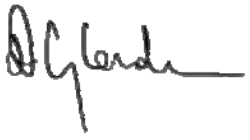
Date commenced: 28/07/2023

Date reported: 31/07/2023

Observations and interpretations are outside of the UKAS Accreditiation

A copy of the Laboratory Schedule of accredited tests as issued by UKAS is attached to this report. This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This certificate shall not be reproduced in full, without the prior written approval of the laboratory.

Samples will be held at the laboratory for a period of 4 weeks after the report date. After the above reporting date the samples will be disposed of. Should further testing be required then the office should be informed before the above date.

Signature:	Approved Signitories:
	☑ D.Anderson (Managing Director) ☐ J. Brischuk (Laboratory Manager) ☐

Summary of Classification Tests

G2M Testing (Stockton)
12-16 Yarm Road,
Stockton on Tees,
TS18 3NA
01642 033318
info@g2mtesting.co.uk

UKAS TESTING

10258

Site name	Job number
Ardersier Port	S230503

Hole	Depth Top m	Depth Base m	Type	*w* %	Oven temp. oc	wa %	Pa %	Pr %	wL %	wP %	IP %	IL	Plasticity class	Preparation method
BHSP07	18.00		B	26	105									

All tests found in G2M Testing UKAS Schedule of Accreditation are tested to standard unless otherwise indicated

Key	Description		Category	BS Test Code
w	Moisture content			BS 1377:1990 Part 2 Clause 3.2
wa	Equivalent moisture content passing 425µm sieve			BS 1377:1990 Part 2 Clause 3.2
wL	Liquid limit	Single point	-s	BS 1377:1990 Part 2 Clause 4.4
		Four point	-f	BS 1377:1990 Part 2 Clause 4.3
wP	Plastic limit			BS 1377:1990 Part 2 Clause 5.2
Pa	Percentage passing 425um sieve			
Pr	Percentage retained 425um sieve			
IP	Plasticity index			BS 1377:1990 Part 2 Clause 5.4
IL	Liquidity index			BS 1377:1990 Part 2 Clause 5.4
	Suffix indicating test is "Not UKAS Accredited"		*	

Approved by	D Anderson
Approval date	31/07/2023 12:32
Date report generated	
Report Number	

PARTICLE SIZE DISTRIBUTION

Site name	Job number
Ardersier Port	S230503

G2M Testing (Stockton)
12-16 Yarm Road,
Stockton on Tees,
TS18 3NA
01642 033318
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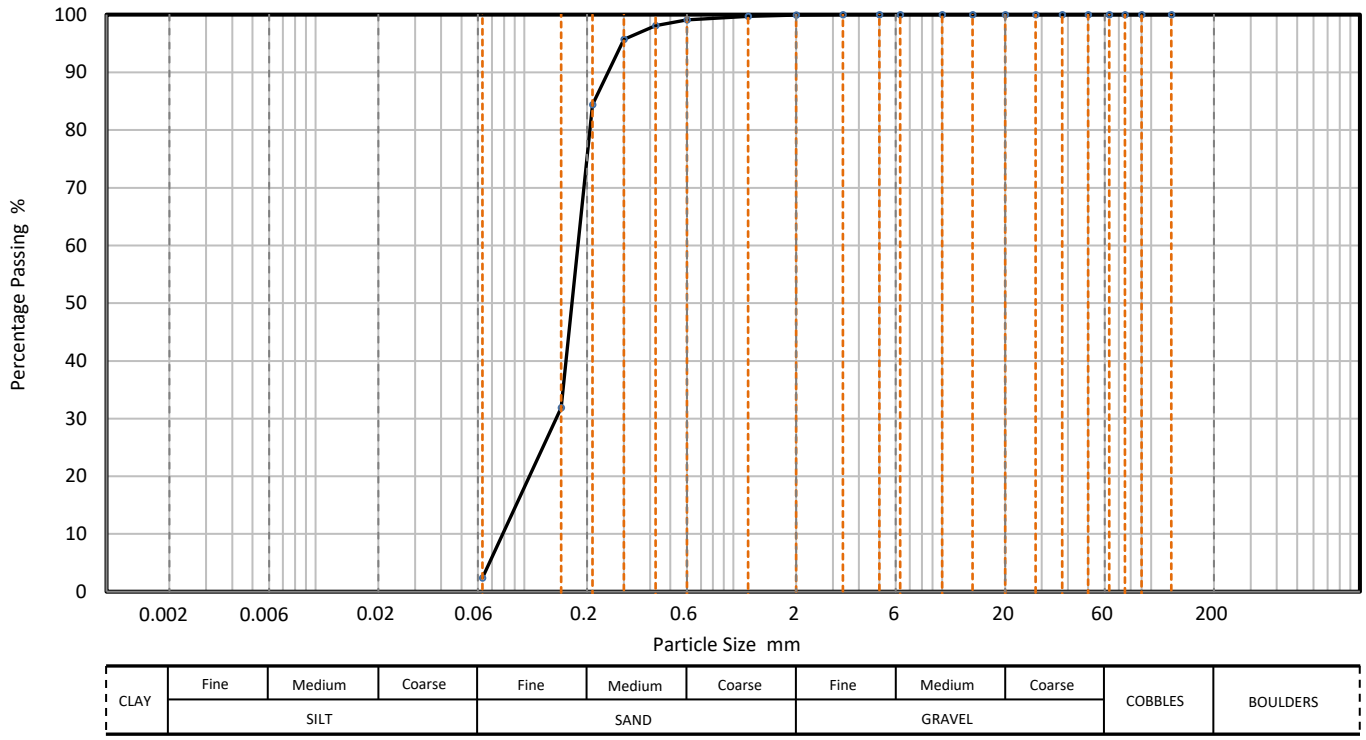
UKAS TESTING
10258

Hole	BHSP07	Lab sample ID	G2MT202307280
Depth (Top) m	18.00	Test Method	BS 1377 - 2 : 1990 Clause 9.2
Depth (Base) m		Soil Description	Very slightly Gravelly, slightly Silty, SAND
Sample type	B		



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	100		
6.3	100		
5	100		
3.35	100		
2	100		
1.18	100		
0.6	99		
0.425	98		
0.3	96		
0.212	84		
0.15	32		
0.063	2		

Dry Mass of sample, g	463

Sample Proportions	% dry mass
Very coarse	0.0
Gravel	0.1
Sand	97.5
Fines <0.063mm	2.0

Grading Analysis		
D100	mm	
D60	mm	0.181
D30	mm	0.142
D10	mm	0.0788
Uniformity Coefficient		2.3
Curvature Coefficient		1.4

Remarks
Preparation and testing in accordance with test method unless noted below

Accreditation status
Hydrometer is the usual Sedimentation method carried out by G2M Testing and is part of the G2M Testing UKAS accreditation schedule.

Approved by	D Anderson
Approval date	31/07/2023 12:35

Laboratory Report Front Sheet

Site name	Job number
Ardersier Port	S230503

G2M Testing (Stockton)
12-16 Yarm Road,
Stockton on Tees,
TS18 3NA
01642 033318
info@g2mtesting.co.uk

UKAS TESTING
10258

Client details:

Reference: S230503
Name: Solmek
Address: 12 Yarm Road,
Stockton-on-tees,
TS18 3NA

Telephone: 01642 607083
Email: acutts@solmek.com

FAO: Ardian Cutts / Richard Woods

Samples received:

Date commenced: 19/06/2023

Date reported: 23/06/2023

Observations and interpretations are outside of the UKAS Accreditiation

A copy of the Laboratory Schedule of accredited tests as issued by UKAS is attached to this report. This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This certificate shall not be reproduced in full, without the prior written approval of the laboratory.

Samples will be held at the laboratory for a period of 4 weeks after the report date. After the above reporting date the samples will be disposed of. Should further testing be required then the office should be informed before the above date.

Signature:	Approved Signitories:
JBrischuk.	☐ D.Anderson (Managing Director) ☑ J. Brischuk (Laboratory Manager) ☐

Summary of Classification Tests

G2M Testing (Stockton)
12-16 Yarm Road,
Stockton on Tees,
TS18 3NA
01642 033318
info@g2mtesting.co.uk

UKAS TESTING
10258

Site name	Job number
Ardersier Port	S230503

Hole	Depth Top m	Depth Base m	Type	*w* %	Oven temp. oc	wa %	Pa %	Pr %	wL %	wP %	IP %	IL	Plasticity class	Preparation method
BHSP08	0.30		B	4.3	105									
BHSP08	2.00		B	6.1	105									
BHSP08	5.00		B	22	105									
BHSP08	8.00		B	11	105									
BHSP08	10.00		B	22	105									
BHSP08	11.80		B	20	105									
BHSP08	13.50		B	19	105									
BHSP08	16.50		B	25	105									
BHSP08	19.50		B	18	105									
BHSP08	21.00		B	22	105									
BHSP08	24.00		B	15	105									
BHSP08	27.00		B	25	105									
BHSP08	30.00		B	20	105									
BHSP08	33.00		B	22	105									
BHSP08	36.00		B	21	105									
BHSP08	39.00		B	26	105									
BHSP09	0.50		B	7.1	105									
BHSP09	2.00		B	5.1	105									
BHSP09	5.00		B	15	105									
BHSP09	8.00		B	9.2	105									

All tests found in G2M Testing UKAS Schedule of Accreditation are tested to standard unless otherwise indicated

Key	Description		Category	BS Test Code
w	Moisture content			BS 1377:1990 Part 2 Clause 3.2
wa	Equivalent moisture content passing 425µm sieve			BS 1377:1990 Part 2 Clause 3.2
wL	Liquid limit	Single point	-s	BS 1377:1990 Part 2 Clause 4.4
		Four point	-f	BS 1377:1990 Part 2 Clause 4.3
wP	Plastic limit			BS 1377:1990 Part 2 Clause 5.2
Pa	Percentage passing 425um sieve			
Pr	Percentage retained 425um sieve			
IP	Plasticity index			BS 1377:1990 Part 2 Clause 5.4
IL	Liquidity index			BS 1377:1990 Part 2 Clause 5.4
	Suffix indicating test is "Not UKAS Accredited"		*	

Approved by	D Anderson
Approval date	23/06/2023 08:00
Date report generated	
Report Number	

Summary of Classification Tests

G2M Testing (Stockton)
12-16 Yarm Road,
Stockton on Tees,
TS18 3NA
01642 033318
info@g2mtesting.co.uk

UKAS TESTING

10258

Site name	Job number
Ardersier Port	S230503

Hole	Depth Top m	Depth Base m	Type	*w* %	Oven temp. oc	wa %	Pa %	Pr %	wL %	wP %	IP %	IL	Plasticity class	Preparation method
BHSP09	10.50		B	20	105									
BHSP09	13.50		B	24	105									
BHSP09	16.50		B	24	105									
BHSP09	19.50		B	23	105									
BHSP09	22.50		B	24	105									
BHSP09	24.00		B	22	105									
BHSP09	27.00		B	25	105									
BHSP09	30.00		B	21	105									
BHSP09	33.00		B	22	105									

All tests found in G2M Testing UKAS Schedule of Accreditation are tested to standard unless otherwise indicated

Key	Description		Category	BS Test Code
w	Moisture content			BS 1377:1990 Part 2 Clause 3.2
wa	Equivalent moisture content passing 425µm sieve			BS 1377:1990 Part 2 Clause 3.2
wL	Liquid limit	Single point	-s	BS 1377:1990 Part 2 Clause 4.4
		Four point	-f	BS 1377:1990 Part 2 Clause 4.3
wP	Plastic limit			BS 1377:1990 Part 2 Clause 5.2
Pa	Percentage passing 425um sieve			
Pr	Percentage retained 425um sieve			
IP	Plasticity index			BS 1377:1990 Part 2 Clause 5.4
IL	Liquidity index			BS 1377:1990 Part 2 Clause 5.4
	Suffix indicating test is "Not UKAS Accredited"		*	

Approved by	JBrischuk
Approval date	23/06/2023 10:28
Date report generated	
Report Number	

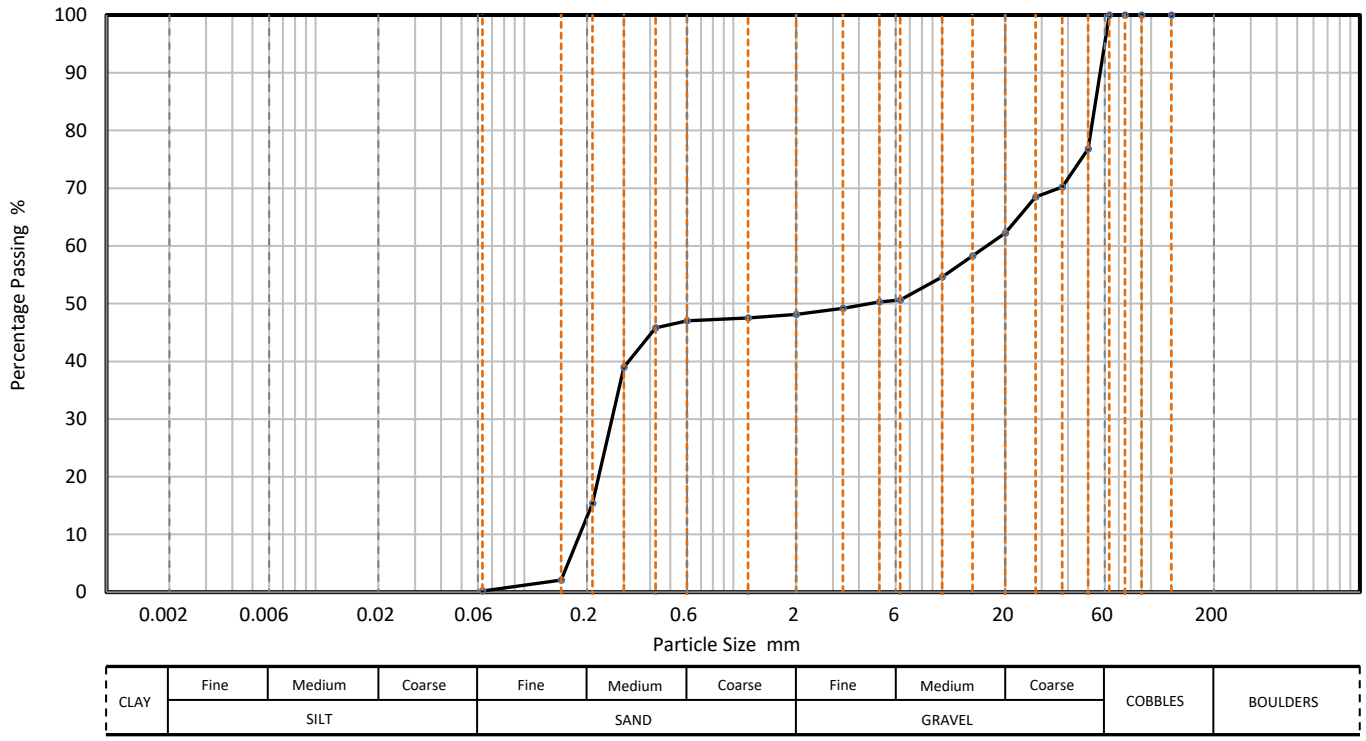
PARTICLE SIZE DISTRIBUTION

Site name	Job number
Ardersier Port	S230503

G2M Testing (Stockton)
12-16 Yarm Road,
Stockton on Tees,
TS18 3NA
01642 033318
info@g2mtesting.co.uk

UKAS TESTING
10258

Hole	BHSP08	Lab sample ID	G2MT2023061943
Depth (Top) m	0.30	Test Method	BS 1377 - 2 : 1990 Clause 9.2
Depth (Base) m		Soil Description	Very Sandy, GRAVEL
Sample type	B		



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	77		
37.5	70		
28	69		
20	62		
14	58		
10	55		
6.3	51		
5	50		
3.35	49		
2	48		
1.18	48		
0.6	47		
0.425	46		
0.3	39		
0.212	15		
0.15	2		
0.063	0		

Dry Mass of sample, g	4893

Sample Proportions	% dry mass
Very coarse	0.0
Gravel	51.9
Sand	47.8
Fines <0.063mm	0.0

Grading Analysis		
D100	mm	
D60	mm	16.3
D30	mm	0.263
D10	mm	0.184
Uniformity Coefficient		89
Curvature Coefficient		0.023

Remarks
Preparation and testing in accordance with test method unless noted below

Accreditation status
Hydrometer is the usual Sedimentation method carried out by G2M Testing and is part of the G2M Testing UKAS accreditation schedule.

Approved by	D Anderson
Approval date	23/06/2023 08:05

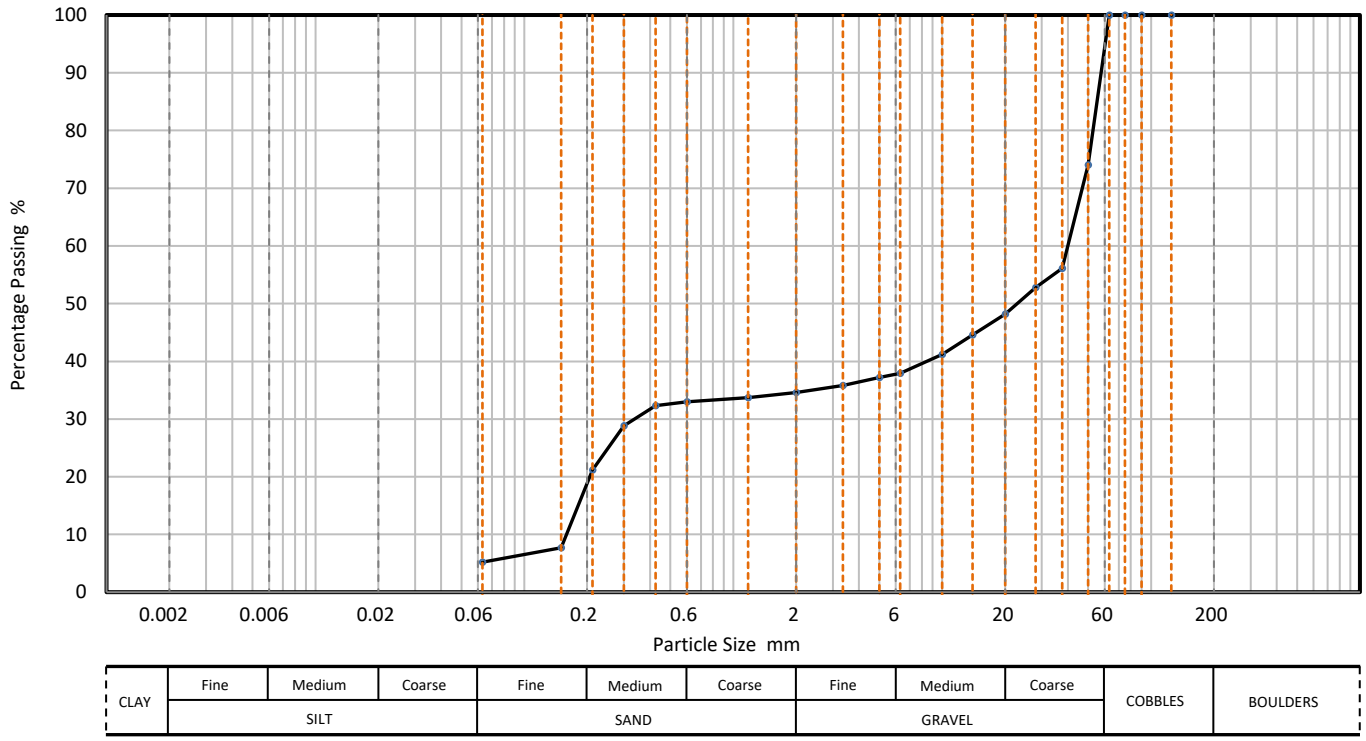
PARTICLE SIZE DISTRIBUTION

Site name	Job number
Ardersier Port	S230503

G2M Testing (Stockton)
12-16 Yarm Road,
Stockton on Tees,
TS18 3NA
01642 033318
info@g2mtesting.co.uk

UKAS TESTING
10258

Hole	BHSP08	Lab sample ID	G2MT2023061944
Depth (Top) m	2.00	Test Method	BS 1377 - 2 : 1990 Clause 9.2
Depth (Base) m		Soil Description	Slightly Silty, very Sandy, GRAVEL
Sample type	B		



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	74		
37.5	56		
28	53		
20	48		
14	45		
10	41		
6.3	38		
5	37		
3.35	36		
2	35		
1.18	34		
0.6	33		
0.425	32		
0.3	29		
0.212	21		
0.15	8		
0.063	5		

Dry Mass of sample, g	3735

Sample Proportions	% dry mass
Very coarse	0.0
Gravel	65.4
Sand	29.4
Fines <0.063mm	5.0

Grading Analysis		
D100	mm	
D60	mm	39.9
D30	mm	0.337
D10	mm	0.159
Uniformity Coefficient		250
Curvature Coefficient		0.018

Remarks

Preparation and testing in accordance with test method unless noted below

Sample tested was deviating in accordance with BS1377 test standard

Accreditation status

Hydrometer is the usual Sedimentation method carried out by G2M Testing and is part of the G2M Testing UKAS accreditation schedule.

Approved by	D Anderson
Approval date	23/06/2023 07:52

PARTICLE SIZE DISTRIBUTION

Site name	Job number
Ardersier Port	S230503

G2M Testing (Stockton)
12-16 Yarm Road,
Stockton on Tees,
TS18 3NA
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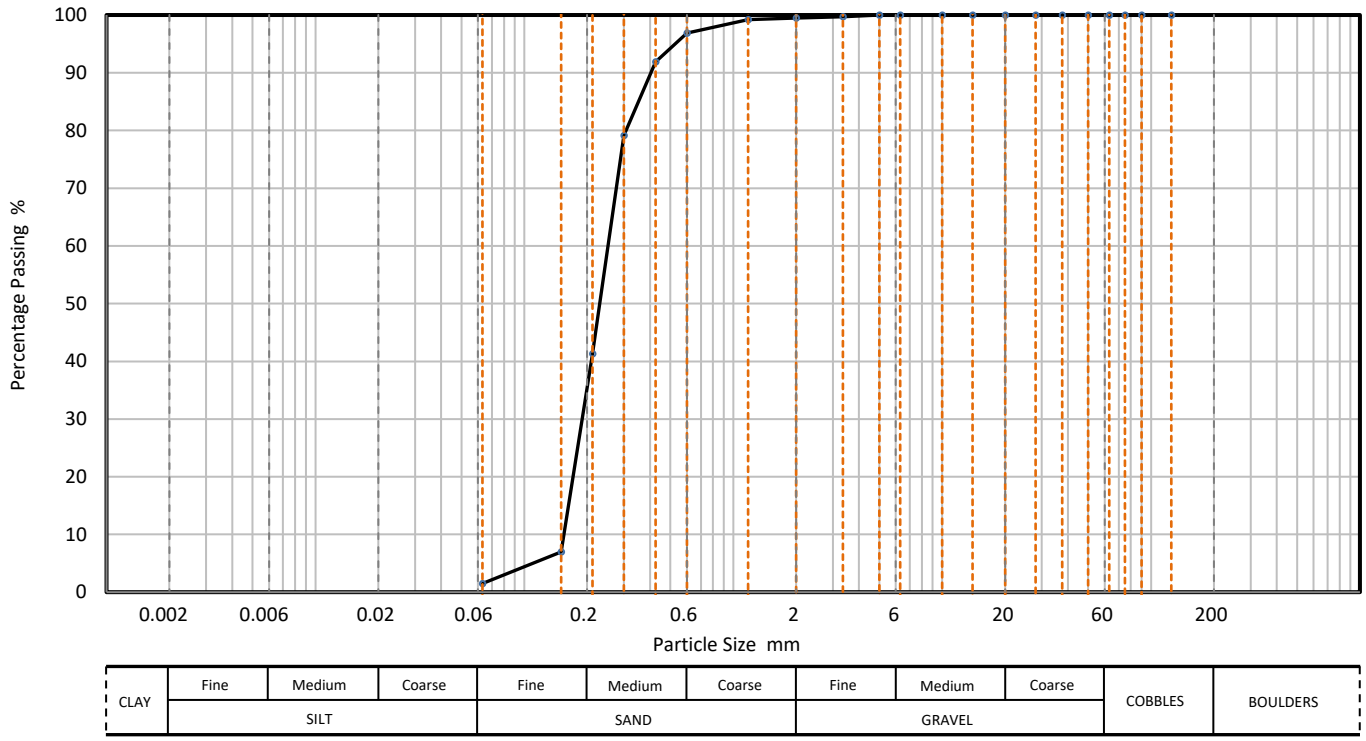
UKAS TESTING
10258

Hole	BHSP08	Lab sample ID	G2MT2023061945
Depth (Top) m	5.00	Test Method	BS 1377 - 2 : 1990 Clause 9.2
Depth (Base) m		Soil Description	Very slightly Gravelly, very slightly Silty, SAND
Sample type	B		



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	100		
6.3	100		
5	100		
3.35	100		
2	100		
1.18	99		
0.6	97		
0.425	92		
0.3	79		
0.212	41		
0.15	7		
0.063	2		

Dry Mass of sample, g: 1409

Sample Proportions	% dry mass
Very coarse	0.0
Gravel	0.5
Sand	98.0
Fines <0.063mm	1.0

Grading Analysis		
D100	mm	
D60	mm	0.252
D30	mm	0.189
D10	mm	0.155
Uniformity Coefficient		1.6
Curvature Coefficient		0.92

Remarks
Preparation and testing in accordance with test method unless noted below

Accreditation status
Hydrometer is the usual Sedimentation method carried out by G2M Testing and is part of the G2M Testing UKAS accreditation schedule.

Approved by	D Anderson
Approval date	23/06/2023 08:14

PARTICLE SIZE DISTRIBUTION

Site name	Job number
Ardersier Port	S230503

G2M Testing (Stockton)
12-16 Yarm Road,
Stockton on Tees,
TS18 3NA
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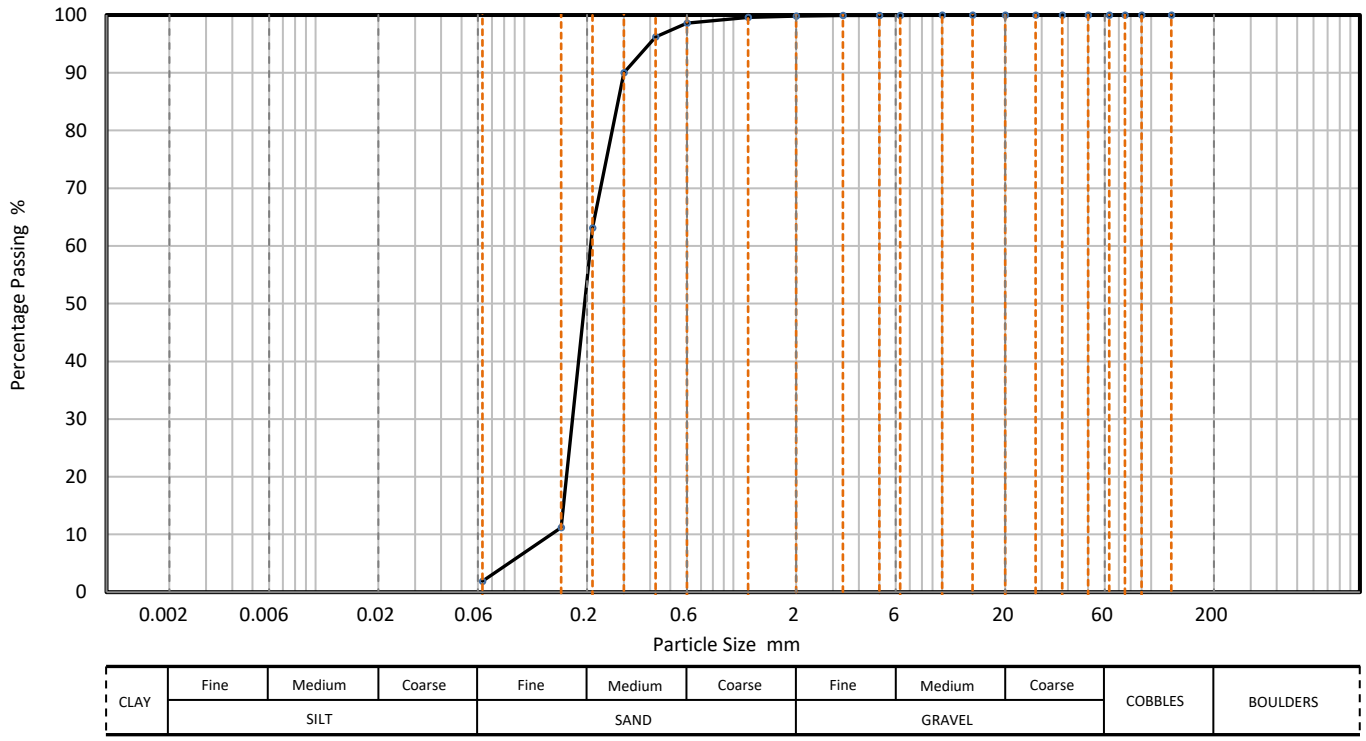
info@g2mtesting.co.uk

UKAS TESTING
10258

Hole	BHSP08	Lab sample ID	G2MT2023061946
Depth (Top) m	8.00	Test Method	BS 1377 - 2 : 1990 Clause 9.2
Depth (Base) m		Soil Description	Very slightly Gravelly, slightly Silty, SAND
Sample type	B		



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	100		
6.3	100		
5	100		
3.35	100		
2	100		
1.18	100		
0.6	99		
0.425	96		
0.3	90		
0.212	63		
0.15	11		
0.063	2		

Dry Mass of sample, g: 824

Sample Proportions	% dry mass
Very coarse	0.0
Gravel	0.2
Sand	97.9
Fines <0.063mm	2.0

Grading Analysis		
D100	mm	
D60	mm	0.208
D30	mm	0.17
D10	mm	0.134
Uniformity Coefficient		1.5
Curvature Coefficient		1

Remarks

Preparation and testing in accordance with test method unless noted below

Accreditation status

Hydrometer is the usual Sedimentation method carried out by G2M Testing and is part of the G2M Testing UKAS accreditation schedule.

Approved by	D Anderson
Approval date	22/06/2023 10:56

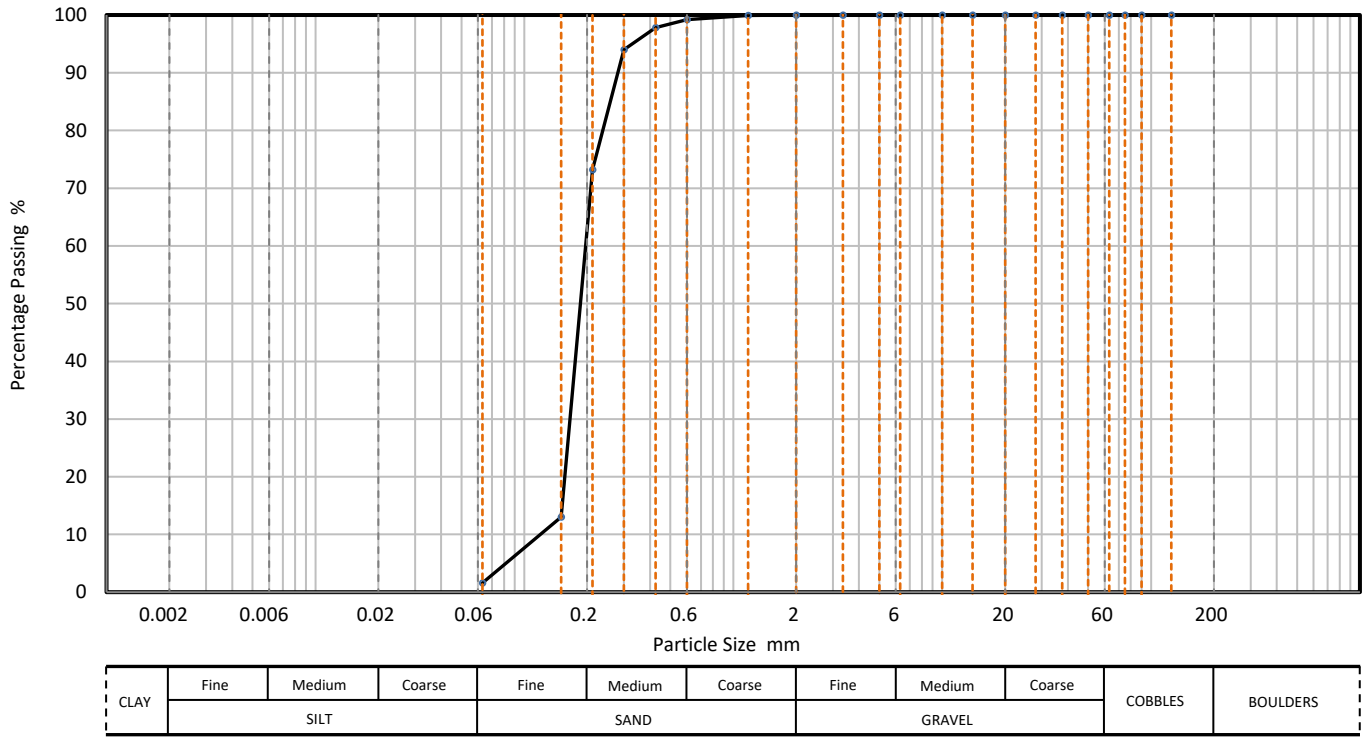
PARTICLE SIZE DISTRIBUTION

Site name	Job number
Ardersier Port	S230503

G2M Testing (Stockton)
12-16 Yarm Road,
Stockton on Tees,
TS18 3NA
01642 033318
info@g2mtesting.co.uk

UKAS TESTING
10258

Hole	BHSP08	Lab sample ID	G2MT2023061947
Depth (Top) m	10.00	Test Method	BS 1377 - 2 : 1990 Clause 9.2
Depth (Base) m		Soil Description	Slightly Silty, SAND
Sample type	B		



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	100		
6.3	100		
5	100		
3.35	100		
2	100		
1.18	100		
0.6	99		
0.425	98		
0.3	94		
0.212	73		
0.15	13		
0.063	2		

Dry Mass of sample, g: 1403

Sample Proportions	% dry mass
Very coarse	0.0
Gravel	0.0
Sand	98.4
Fines <0.063mm	2.0

Grading Analysis		
D100	mm	
D60	mm	0.196
D30	mm	0.165
D10	mm	0.119
Uniformity Coefficient		1.6
Curvature Coefficient		1.2

Remarks
Preparation and testing in accordance with test method unless noted below

Accreditation status
Hydrometer is the usual Sedimentation method carried out by G2M Testing and is part of the G2M Testing UKAS accreditation schedule.

Approved by	D Anderson
Approval date	22/06/2023 11:02

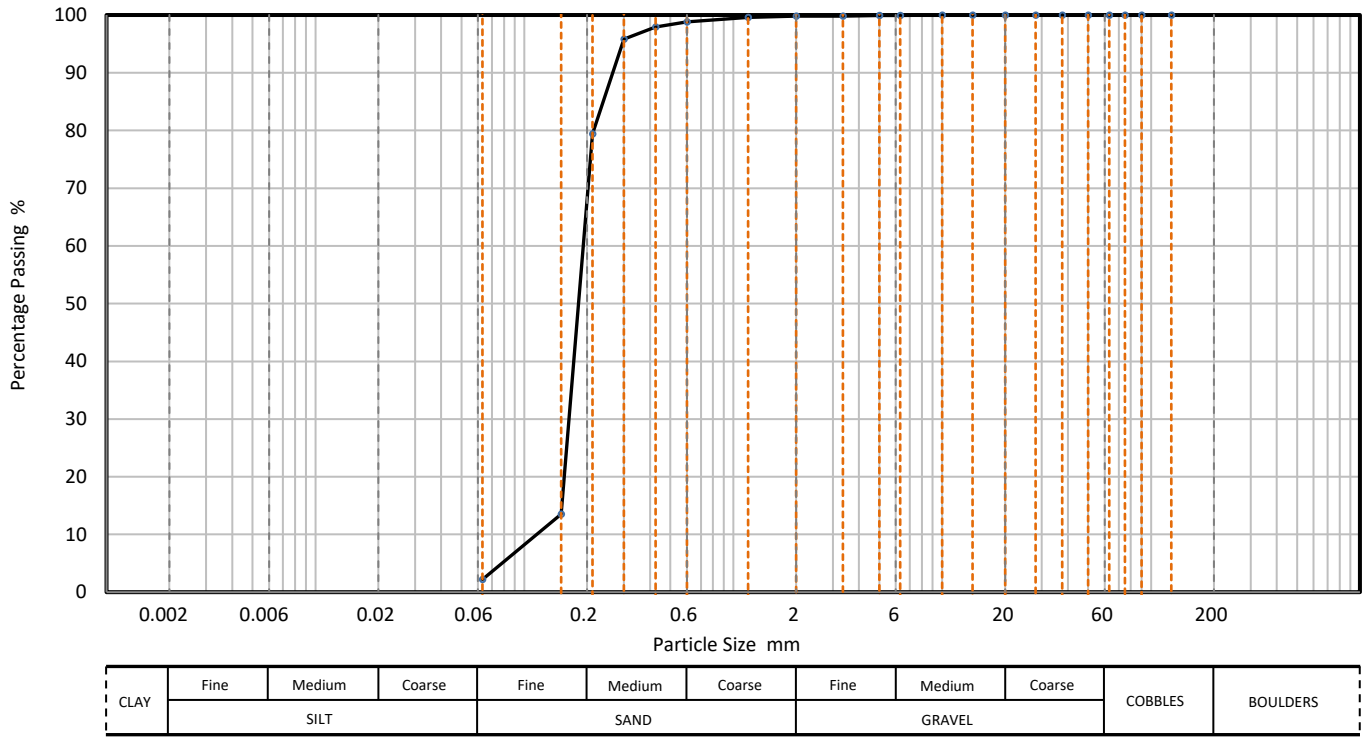
PARTICLE SIZE DISTRIBUTION

Site name	Job number
Ardersier Port	S230503

G2M Testing (Stockton)
12-16 Yarm Road,
Stockton on Tees,
TS18 3NA
01642 033318
info@g2mtesting.co.uk

UKAS TESTING
10258

Hole	BHSP08	Lab sample ID	G2MT2023061948
Depth (Top) m	11.80	Test Method	BS 1377 - 2 : 1990 Clause 9.2
Depth (Base) m		Soil Description	Very slightly Gravelly, slightly Silty, SAND
Sample type	B		



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	100		
6.3	100		
5	100		
3.35	100		
2	100		
1.18	100		
0.6	99		
0.425	98		
0.3	96		
0.212	79		
0.15	14		
0.063	2		

Dry Mass of sample, g: 1477

Sample Proportions	% dry mass
Very coarse	0.0
Gravel	0.2
Sand	97.5
Fines <0.063mm	2.0

Grading Analysis		
D100	mm	
D60	mm	0.191
D30	mm	0.164
D10	mm	0.115
Uniformity Coefficient		1.7
Curvature Coefficient		1.2

Remarks
Preparation and testing in accordance with test method unless noted below

Accreditation status
Hydrometer is the usual Sedimentation method carried out by G2M Testing and is part of the G2M Testing UKAS accreditation schedule.

Approved by	D Anderson
Approval date	23/06/2023 09:45

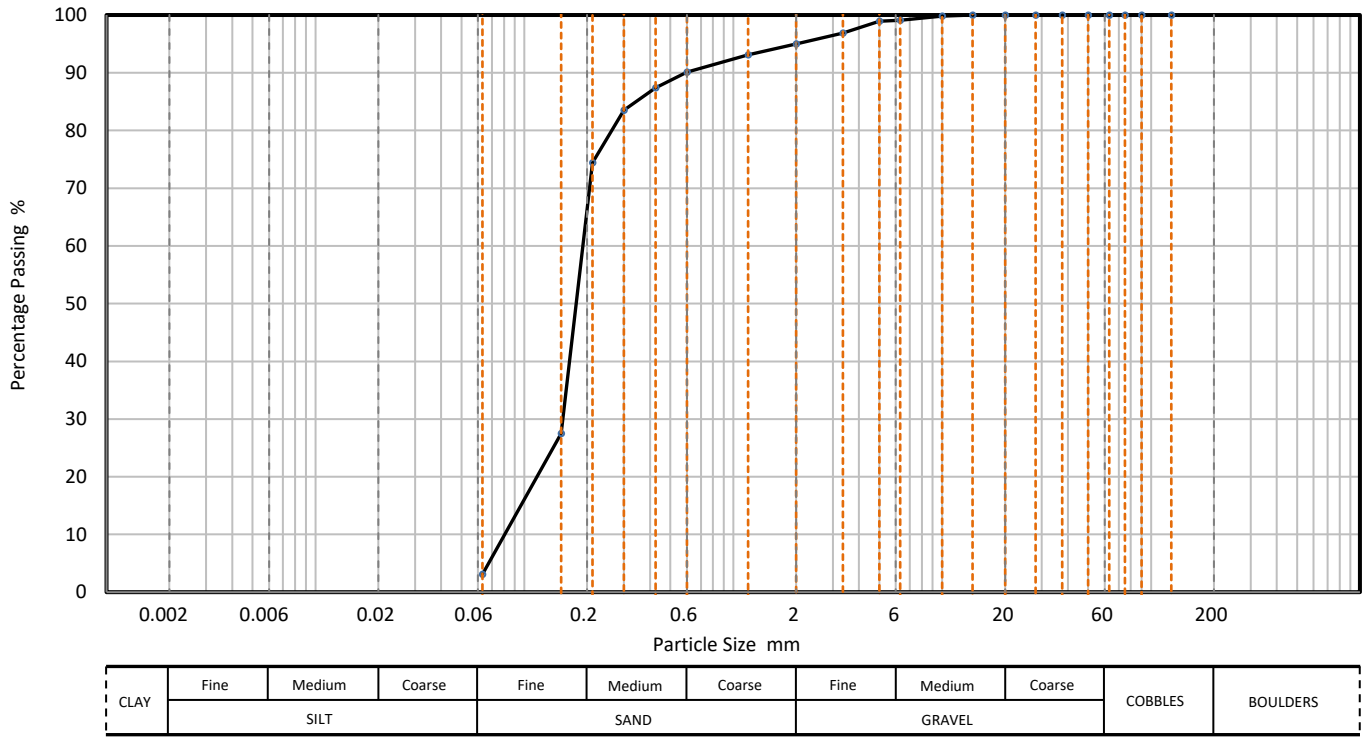
PARTICLE SIZE DISTRIBUTION

Site name	Job number
Ardersier Port	S230503

G2M Testing (Stockton)
12-16 Yarm Road,
Stockton on Tees,
TS18 3NA
01642 033318
info@g2mtesting.co.uk

UKAS TESTING
10258

Hole	BHSP08	Lab sample ID	G2MT2023061949
Depth (Top) m	13.50	Test Method	BS 1377 - 2 : 1990 Clause 9.2
Depth (Base) m		Soil Description	Slightly Silty, slightly Gravelly, SAND
Sample type	B		



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	100		
6.3	99		
5	99		
3.35	97		
2	95		
1.18	93		
0.6	90		
0.425	87		
0.3	84		
0.212	74		
0.15	28		
0.063	3		

Dry Mass of sample, g	1806

Sample Proportions	% dry mass
Very coarse	0.0
Gravel	5.0
Sand	91.9
Fines <0.063mm	3.0

Grading Analysis		
D100	mm	
D60	mm	0.191
D30	mm	0.153
D10	mm	0.0804
Uniformity Coefficient		2.4
Curvature Coefficient		1.5

Remarks
Preparation and testing in accordance with test method unless noted below

Accreditation status
Hydrometer is the usual Sedimentation method carried out by G2M Testing and is part of the G2M Testing UKAS accreditation schedule.

Approved by	D Anderson
Approval date	23/06/2023 09:55

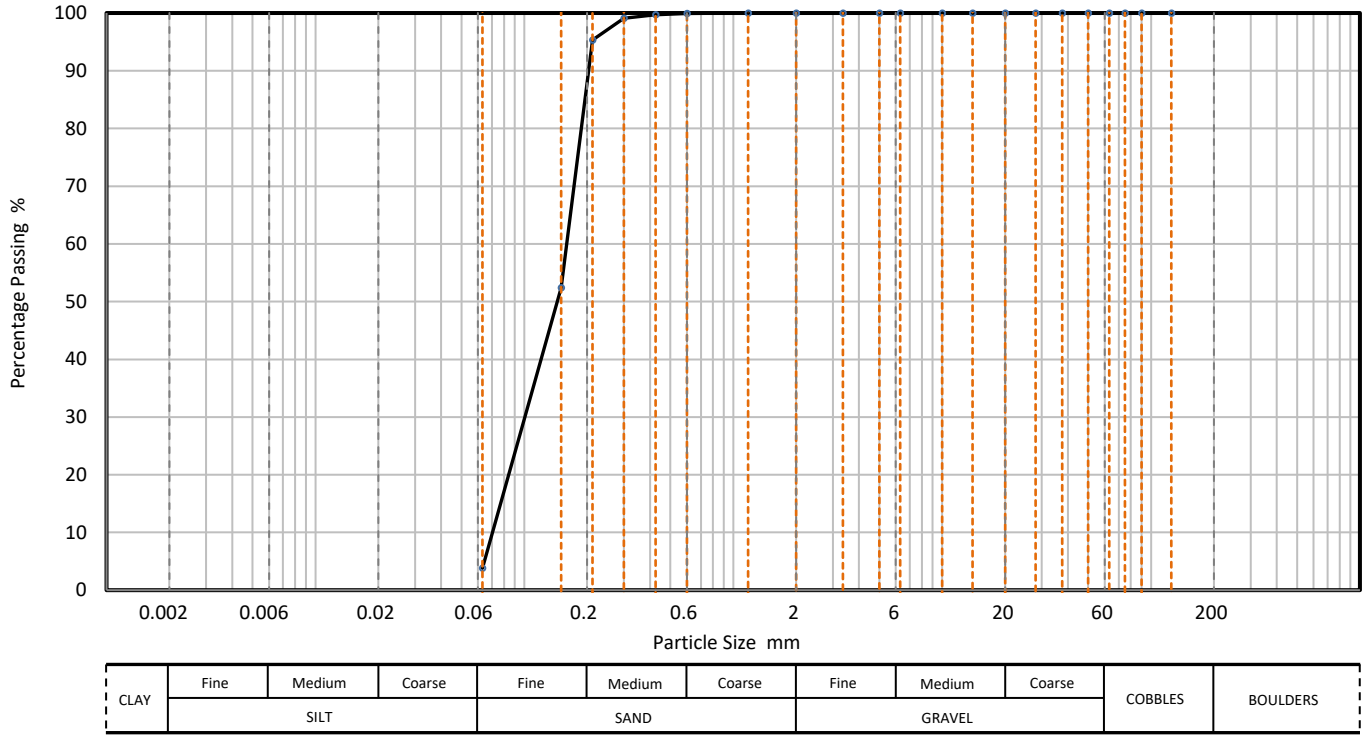
PARTICLE SIZE DISTRIBUTION

Site name	Job number
Ardersier Port	S230503

G2M Testing (Stockton)
12-16 Yarm Road,
Stockton on Tees,
TS18 3NA
01642 033318
info@g2mtesting.co.uk

UKAS TESTING
10258

Hole	BHSP08	Lab sample ID	G2MT2023061950
Depth (Top) m	16.50	Test Method	BS 1377 - 2 : 1990 Clause 9.2
Depth (Base) m		Soil Description	Slightly Silty, SAND
Sample type	B		



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	100		
6.3	100		
5	100		
3.35	100		
2	100		
1.18	100		
0.6	100		
0.425	100		
0.3	99		
0.212	95		
0.15	52		
0.063	4		

Dry Mass of sample, g	1523

Sample Proportions	% dry mass
Very coarse	0.0
Gravel	0.0
Sand	96.2
Fines <0.063mm	4.0

Grading Analysis		
D100	mm	
D60	mm	0.159
D30	mm	0.101
D10	mm	0.0704
Uniformity Coefficient		2.3
Curvature Coefficient		0.9

Remarks
Preparation and testing in accordance with test method unless noted below

Accreditation status
Hydrometer is the usual Sedimentation method carried out by G2M Testing and is part of the G2M Testing UKAS accreditation schedule.

Approved by	D Anderson
Approval date	22/06/2023 11:05

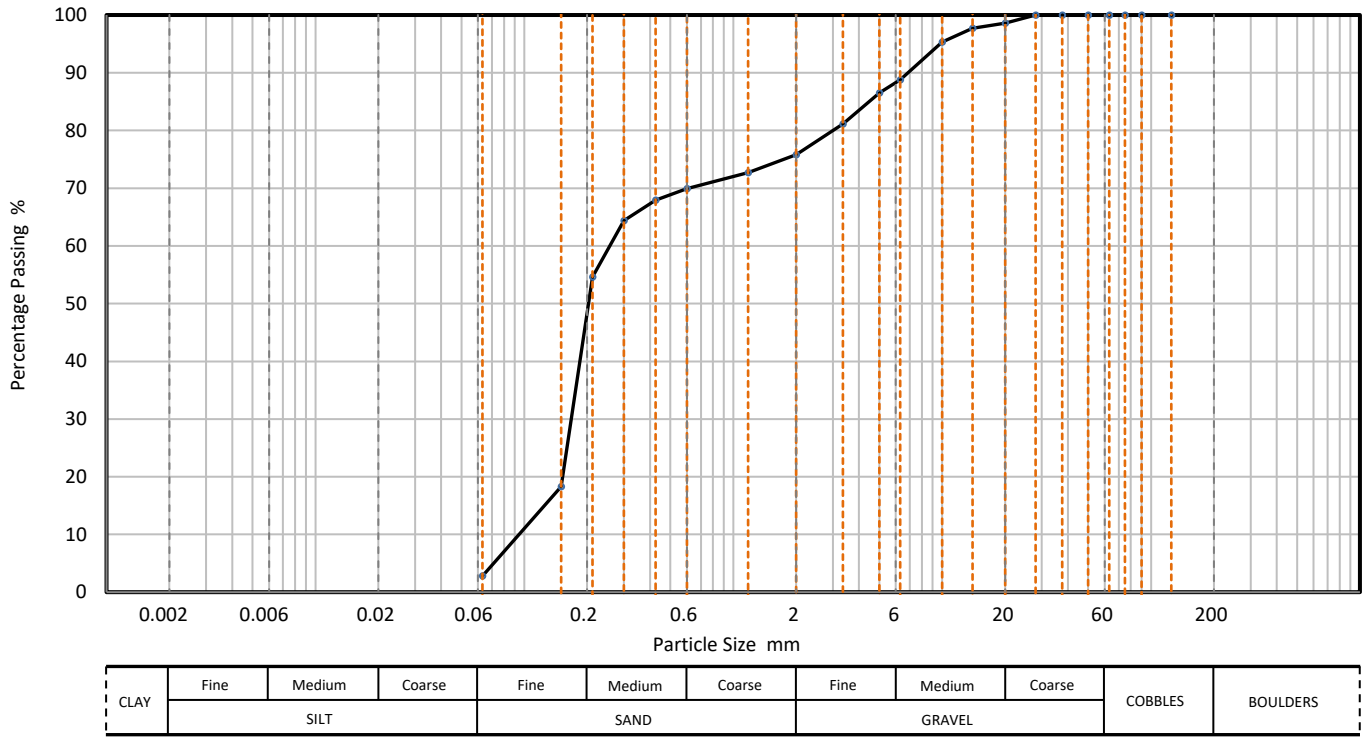
PARTICLE SIZE DISTRIBUTION

Site name	Job number
Ardersier Port	S230503

G2M Testing (Stockton)
12-16 Yarm Road,
Stockton on Tees,
TS18 3NA
01642 033318
info@g2mtesting.co.uk

UKAS TESTING
10258

Hole		BHSP08	Lab sample ID	G2MT2023061951
Depth (Top)	m	19.50	Test Method	BS 1377 - 2 : 1990 Clause 9.2
Depth (Base)	m		Soil Description	Slightly Silty, very Gravelly, SAND
Sample type		B		



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	99		
14	98		
10	95		
6.3	89		
5	87		
3.35	81		
2	76		
1.18	73		
0.6	70		
0.425	68		
0.3	64		
0.212	55		
0.15	18		
0.063	3		

Dry Mass of sample, g	1695

Sample Proportions	% dry mass
Very coarse	0.0
Gravel	24.2
Sand	73.0
Fines <0.063mm	3.0

Grading Analysis		
D100	mm	
D60	mm	0.256
D30	mm	0.168
D10	mm	0.0943
Uniformity Coefficient		2.7
Curvature Coefficient		1.2

Remarks

Preparation and testing in accordance with test method unless noted below

Sample tested was deviating in accordance with BS1377 test standard

Accreditation status

Hydrometer is the usual Sedimentation method carried out by G2M Testing and is part of the G2M Testing UKAS accreditation schedule.

Approved by	D Anderson
Approval date	22/06/2023 07:58

PARTICLE SIZE DISTRIBUTION

Site name	Job number
Ardersier Port	S230503

G2M Testing (Stockton)
12-16 Yarm Road,
Stockton on Tees,
TS18 3NA
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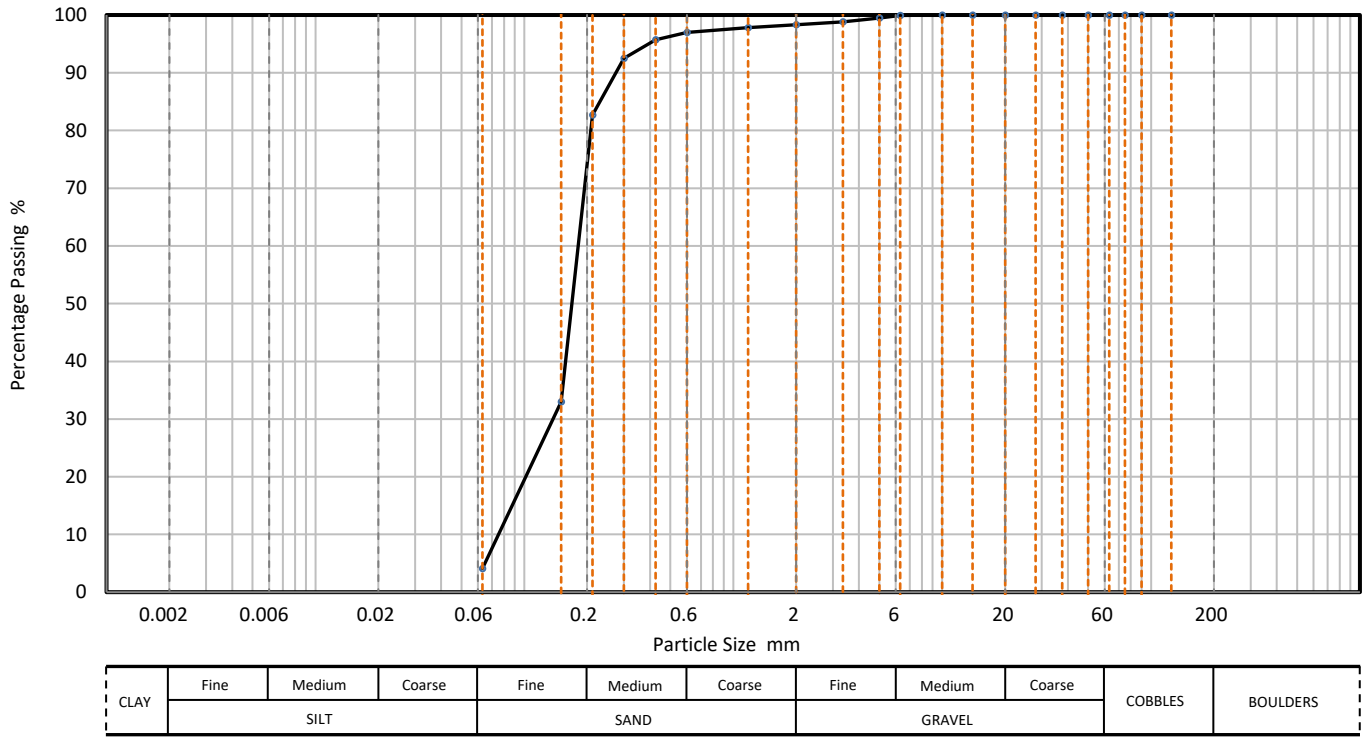
info@g2mtesting.co.uk

UKAS TESTING
10258

Hole	BHSP08	Lab sample ID	G2MT2023061952
Depth (Top) m	21.00	Test Method	BS 1377 - 2 : 1990 Clause 9.2
Depth (Base) m		Soil Description	Slightly Gravelly, slightly Silty, SAND
Sample type	B		



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	100		
6.3	100		
5	100		
3.35	99		
2	98		
1.18	98		
0.6	97		
0.425	96		
0.3	93		
0.212	83		
0.15	33		
0.063	4		

Dry Mass of sample, g: 1379

Sample Proportions	% dry mass
Very coarse	0.0
Gravel	1.7
Sand	94.2
Fines <0.063mm	4.0

Grading Analysis		
D100	mm	
D60	mm	0.181
D30	mm	0.137
D10	mm	0.0753
Uniformity Coefficient		2.4
Curvature Coefficient		1.4

Remarks
Preparation and testing in accordance with test method unless noted below

Accreditation status
Hydrometer is the usual Sedimentation method carried out by G2M Testing and is part of the G2M Testing UKAS accreditation schedule.

Approved by	D Anderson
Approval date	23/06/2023 07:58

PARTICLE SIZE DISTRIBUTION

Site name	Job number
Ardersier Port	S230503

G2M Testing (Stockton)
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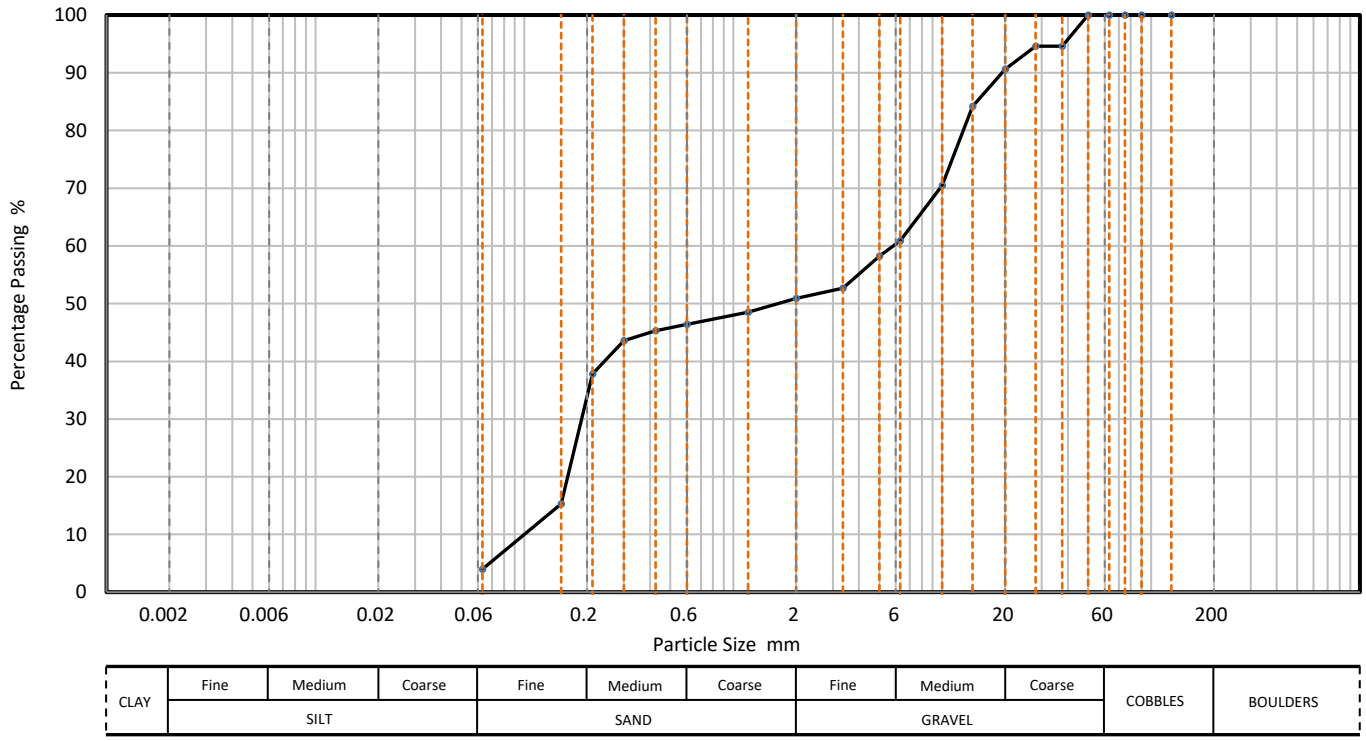
UKAS TESTING
10258

Hole	BHSP08	Lab sample ID	G2MT2023061953
Depth (Top) m	24.00	Test Method	BS 1377 - 2 : 1990 Clause 9.2
Depth (Base) m		Soil Description	Slightly Silty, very Sandy, GRAVEL
Sample type	B		



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	95		
28	95		
20	91		
14	84		
10	71		
6.3	61		
5	58		
3.35	53		
2	51		
1.18	49		
0.6	46		
0.425	45		
0.3	44		
0.212	38		
0.15	15		
0.063	4		

Dry Mass of sample, g: 1772

Sample Proportions	% dry mass
Very coarse	0.0
Gravel	49.1
Sand	47.0
Fines <0.063mm	4.0

Grading Analysis		
D100	mm	
D60	mm	5.84
D30	mm	0.188
D10	mm	0.0999
Uniformity Coefficient		58
Curvature Coefficient		0.061

Remarks

Preparation and testing in accordance with test method unless noted below

Sample tested was deviating in accordance with BS1377 test standard

Accreditation status

Hydrometer is the usual Sedimentation method carried out by G2M Testing and is part of the G2M Testing UKAS accreditation schedule.

Approved by	D Anderson
Approval date	23/06/2023 08:10

PARTICLE SIZE DISTRIBUTION

Site name	Job number
Ardersier Port	S230503

G2M Testing (Stockton)
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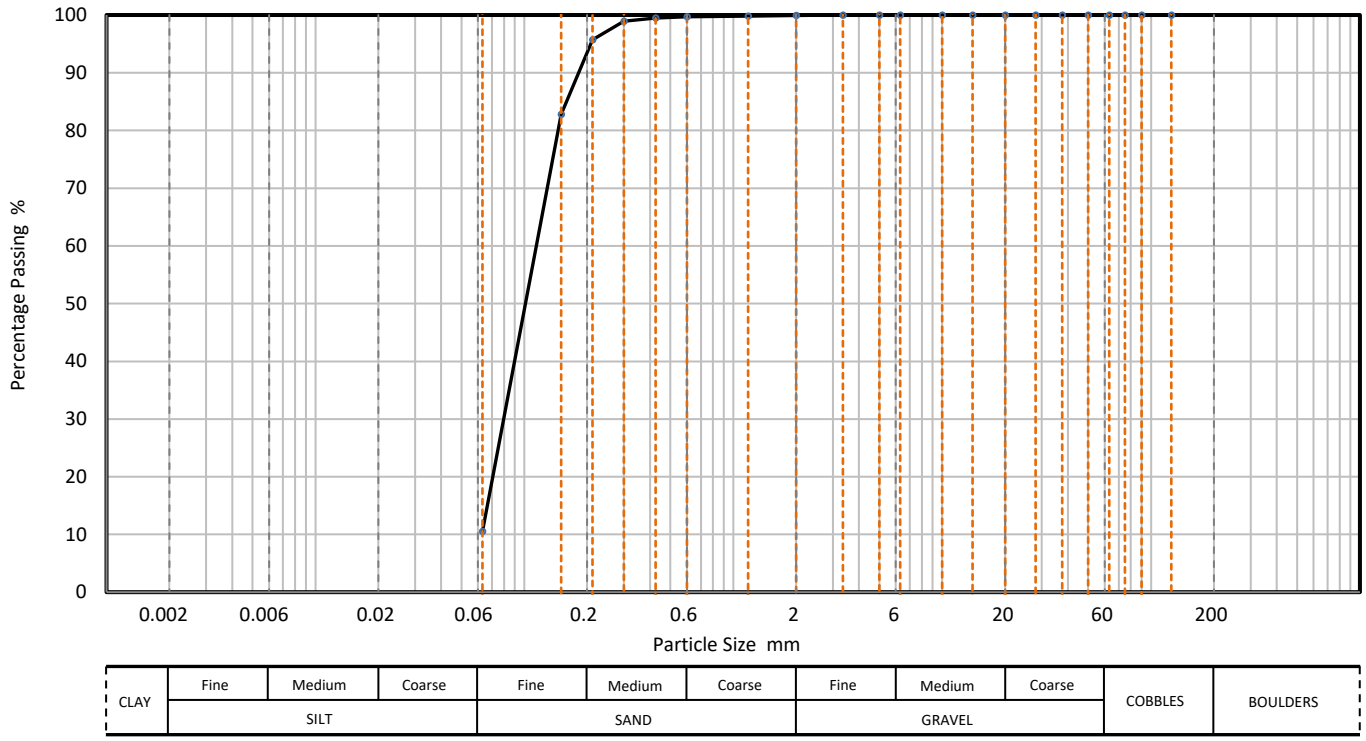
UKAS TESTING
10258

Hole	BHSP08	Lab sample ID	G2MT2023061954
Depth (Top) m	27.00	Test Method	BS 1377 - 2 : 1990 Clause 9.2
Depth (Base) m		Soil Description	Very slightly Gravelly, Silty, SAND
Sample type	B		



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	100		
6.3	100		
5	100		
3.35	100		
2	100		
1.18	100		
0.6	100		
0.425	100		
0.3	99		
0.212	96		
0.15	83		
0.063	11		

Dry Mass of sample, g: 1402

Sample Proportions	% dry mass
Very coarse	0.0
Gravel	0.1
Sand	89.4
Fines <0.063mm	11.0

Grading Analysis		
D100	mm	
D60	mm	0.114
D30	mm	0.0796
D10	mm	
Uniformity Coefficient		
Curvature Coefficient		

Remarks
Preparation and testing in accordance with test method unless noted below

Accreditation status
Hydrometer is the usual Sedimentation method carried out by G2M Testing and is part of the G2M Testing UKAS accreditation schedule.

Approved by	D Anderson
Approval date	23/06/2023 10:03

PARTICLE SIZE DISTRIBUTION

Site name	Job number
Ardersier Port	S230503

G2M Testing (Stockton)
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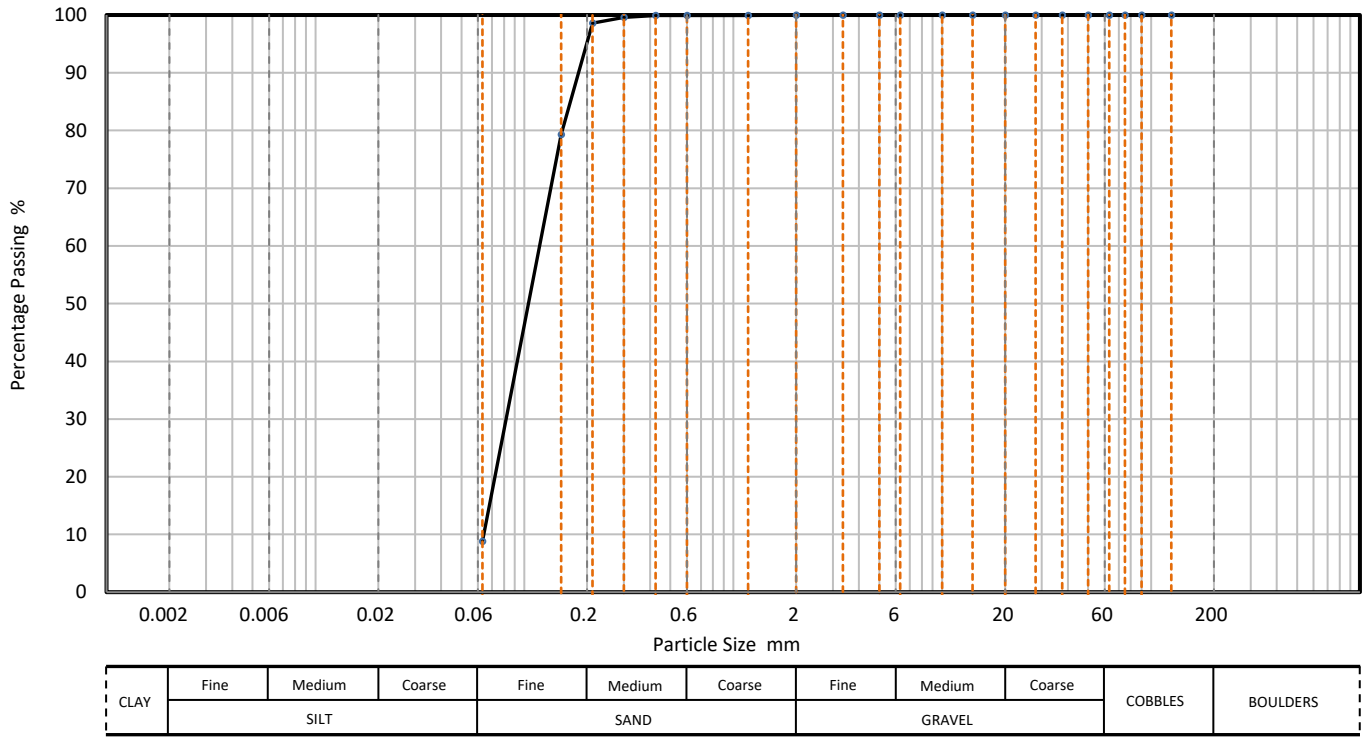
UKAS TESTING
10258

Hole	BHSP08	Lab sample ID	G2MT2023061955
Depth (Top) m	30.00	Test Method	BS 1377 - 2 : 1990 Clause 9.2
Depth (Base) m		Soil Description	Slightly Silty, SAND
Sample type	B		



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	100		
6.3	100		
5	100		
3.35	100		
2	100		
1.18	100		
0.6	100		
0.425	100		
0.3	100		
0.212	99		
0.15	79		
0.063	9		

Dry Mass of sample, g: 1600

Sample Proportions	% dry mass
Very coarse	0.0
Gravel	0.0
Sand	91.1
Fines <0.063mm	9.0

Grading Analysis		
D100	mm	
D60	mm	0.118
D30	mm	0.0818
D10	mm	0.0639
Uniformity Coefficient		1.9
Curvature Coefficient		0.88

Remarks
Preparation and testing in accordance with test method unless noted below

Accreditation status
Hydrometer is the usual Sedimentation method carried out by G2M Testing and is part of the G2M Testing UKAS accreditation schedule.

Approved by	D Anderson
Approval date	22/06/2023 11:09

PARTICLE SIZE DISTRIBUTION

Site name	Job number
Ardersier Port	S230503

G2M Testing (Stockton)
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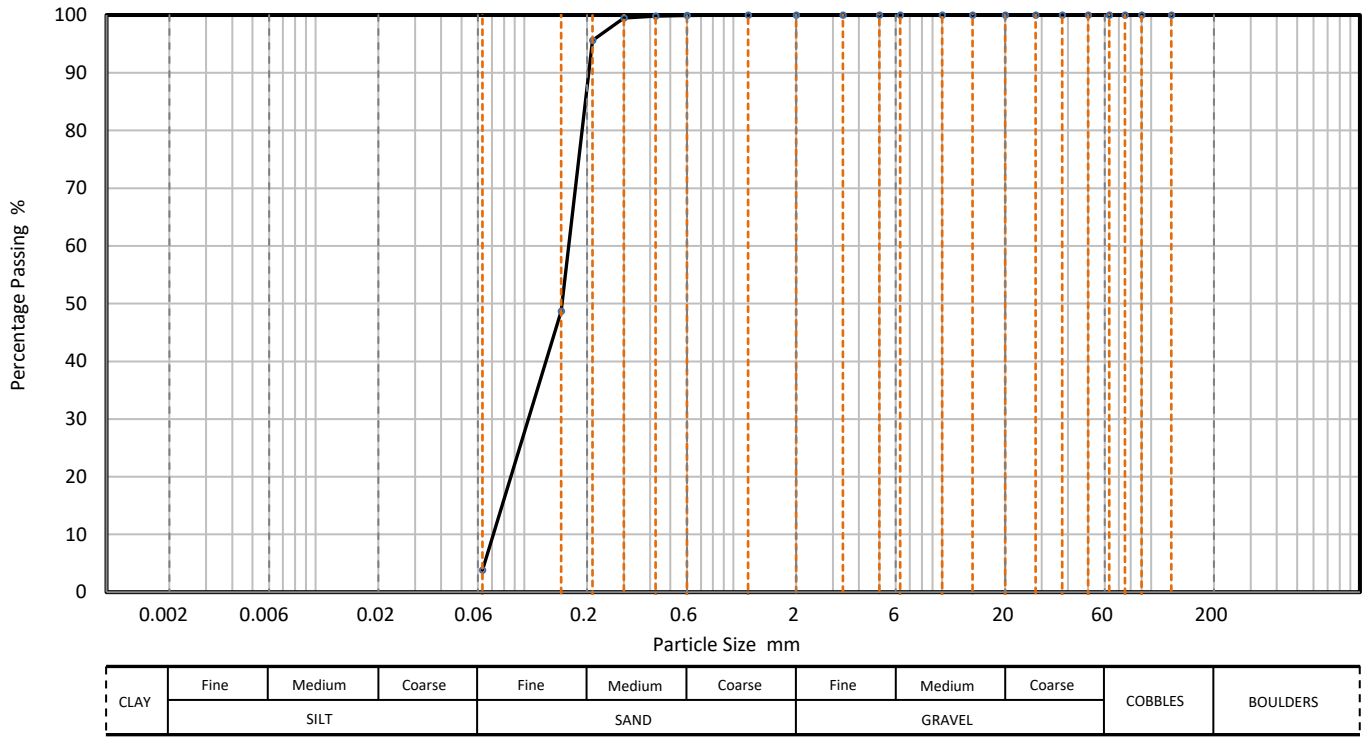
UKAS TESTING
10258

Hole	BHSP08	Lab sample ID	G2MT2023061956
Depth (Top) m	33.00	Test Method	BS 1377 - 2 : 1990 Clause 9.2
Depth (Base) m		Soil Description	Slightly Silty, SAND
Sample type	B		



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	100		
6.3	100		
5	100		
3.35	100		
2	100		
1.18	100		
0.6	100		
0.425	100		
0.3	100		
0.212	96		
0.15	49		
0.063	4		

Dry Mass of sample, g	1549

Sample Proportions	% dry mass
Very coarse	0.0
Gravel	0.0
Sand	96.2
Fines <0.063mm	4.0

Grading Analysis		
D100	mm	
D60	mm	0.163
D30	mm	0.105
D10	mm	0.0711
Uniformity Coefficient		2.3
Curvature Coefficient		0.94

Remarks
Preparation and testing in accordance with test method unless noted below

Accreditation status
Hydrometer is the usual Sedimentation method carried out by G2M Testing and is part of the G2M Testing UKAS accreditation schedule.

Approved by	D Anderson
Approval date	22/06/2023 11:12

PARTICLE SIZE DISTRIBUTION

Site name	Job number
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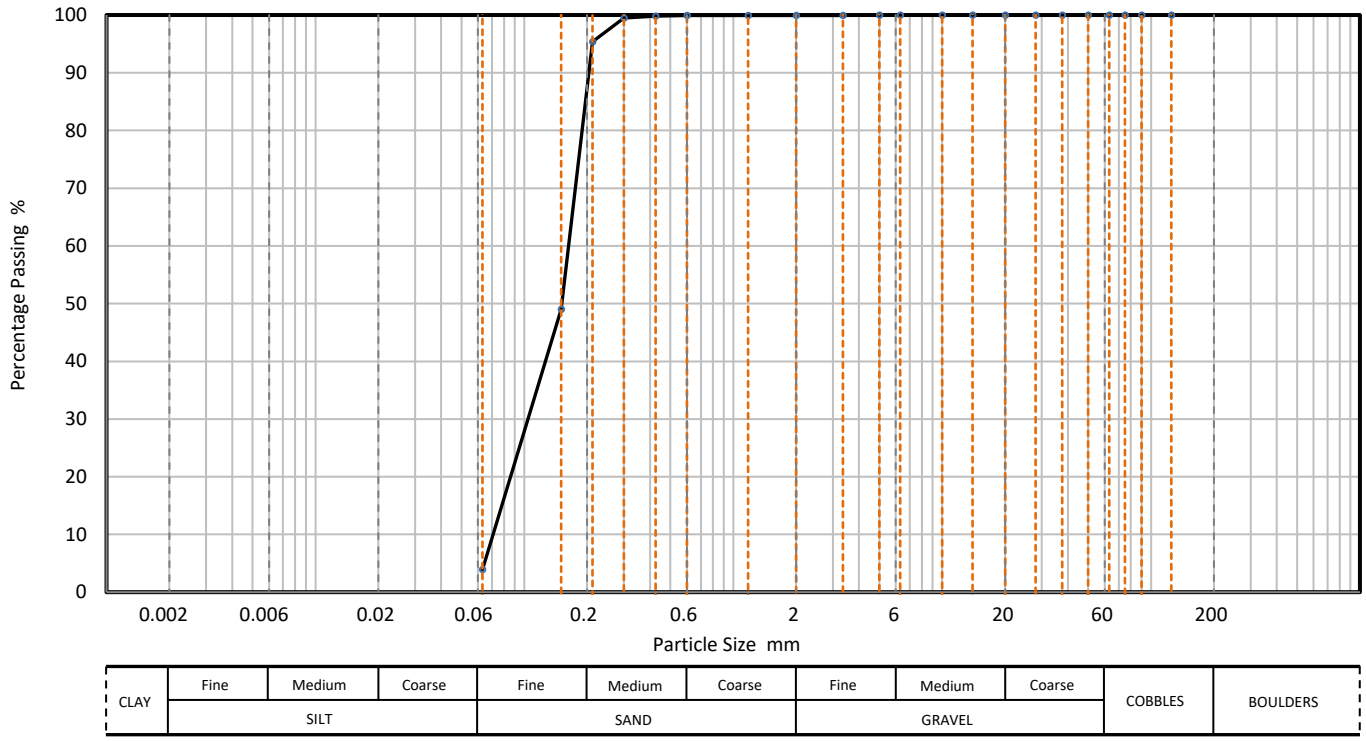
UKAS TESTING
10258

Hole	BHSP08	Lab sample ID	G2MT2023061957
Depth (Top) m	36.00	Test Method	BS 1377 - 2 : 1990 Clause 9.2
Depth (Base) m		Soil Description	Very Slightly Gravelly, slightly Silty, SAND
Sample type	B		



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	100		
6.3	100		
5	100		
3.35	100		
2	100		
1.18	100		
0.6	100		
0.425	100		
0.3	100		
0.212	95		
0.15	49		
0.063	4		

Dry Mass of sample, g	1528

Sample Proportions	% dry mass
Very coarse	0.0
Gravel	0.1
Sand	96.0
Fines <0.063mm	4.0

Grading Analysis		
D100	mm	
D60	mm	0.163
D30	mm	0.104
D10	mm	0.0708
Uniformity Coefficient		2.3
Curvature Coefficient		0.94

Remarks
Preparation and testing in accordance with test method unless noted below

Accreditation status
Hydrometer is the usual Sedimentation method carried out by G2M Testing and is part of the G2M Testing UKAS accreditation schedule.

Approved by	D Anderson
Approval date	23/06/2023 10:06

PARTICLE SIZE DISTRIBUTION

Site name	Job number
Ardersier Port	S230503

G2M Testing (Stockton)
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Stockton on Tees,
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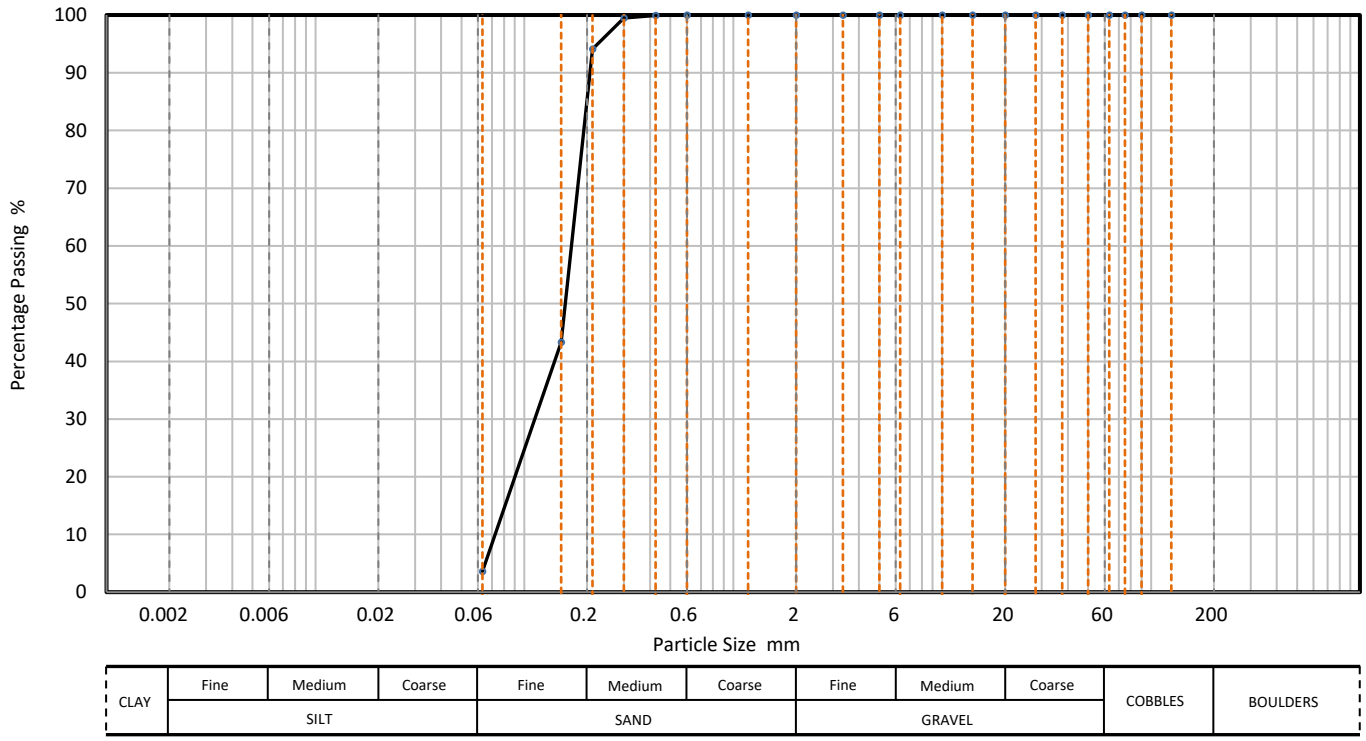
UKAS TESTING
10258

Hole	BHSP08	Lab sample ID	G2MT2023061958
Depth (Top) m	39.00	Test Method	BS 1377 - 2 : 1990 Clause 9.2
Depth (Base) m		Soil Description	Slightly Silty, SAND
Sample type	B		



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	100		
6.3	100		
5	100		
3.35	100		
2	100		
1.18	100		
0.6	100		
0.425	100		
0.3	100		
0.212	94		
0.15	43		
0.063	4		

Dry Mass of sample, g	1338

Sample Proportions	% dry mass
Very coarse	0.0
Gravel	0.0
Sand	96.4
Fines <0.063mm	4.0

Grading Analysis		
D100	mm	
D60	mm	0.168
D30	mm	0.112
D10	mm	0.0724
Uniformity Coefficient		2.3
Curvature Coefficient		1

Remarks
Preparation and testing in accordance with test method unless noted below

Accreditation status
Hydrometer is the usual Sedimentation method carried out by G2M Testing and is part of the G2M Testing UKAS accreditation schedule.

Approved by	D Anderson
Approval date	22/06/2023 10:59

PARTICLE SIZE DISTRIBUTION

Site name	Job number
Ardersier Port	S230503

G2M Testing (Stockton)
12-16 Yarm Road,
Stockton on Tees,
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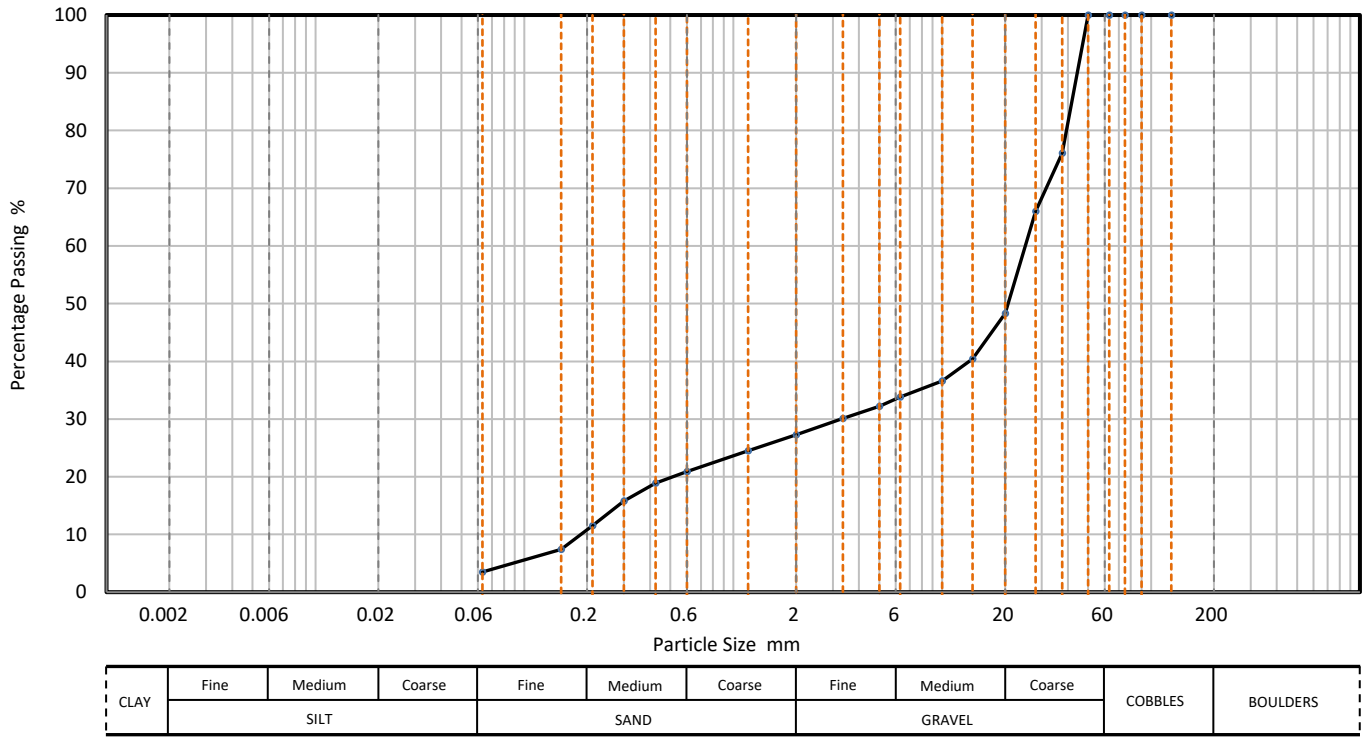
UKAS TESTING
10258

Hole	BHSP09	Lab sample ID	G2MT2023061926
Depth (Top) m	0.50	Test Method	BS 1377 - 2 : 1990 Clause 9.2
Depth (Base) m		Soil Description	Slightly Silty, very Sandy, GRAVEL
Sample type	B		



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	76		
28	66		
20	48		
14	40		
10	37		
6.3	34		
5	32		
3.35	30		
2	27		
1.18	25		
0.6	21		
0.425	19		
0.3	16		
0.212	12		
0.15	7		
0.063	4		

Dry Mass of sample, g: 3217

Sample Proportions	% dry mass
Very coarse	0.0
Gravel	72.7
Sand	23.9
Fines <0.063mm	3.0

Grading Analysis		
D100	mm	
D60	mm	25
D30	mm	3.29
D10	mm	0.187
Uniformity Coefficient		130
Curvature Coefficient		2.3

Remarks

Preparation and testing in accordance with test method unless noted below

Sample tested was deviating in accordance with BS1377 test standard

Accreditation status

Hydrometer is the usual Sedimentation method carried out by G2M Testing and is part of the G2M Testing UKAS accreditation schedule.

Approved by	D Anderson
Approval date	23/06/2023 09:08

PARTICLE SIZE DISTRIBUTION

Site name	Job number
Ardersier Port	S230503

G2M Testing (Stockton)
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Stockton on Tees,
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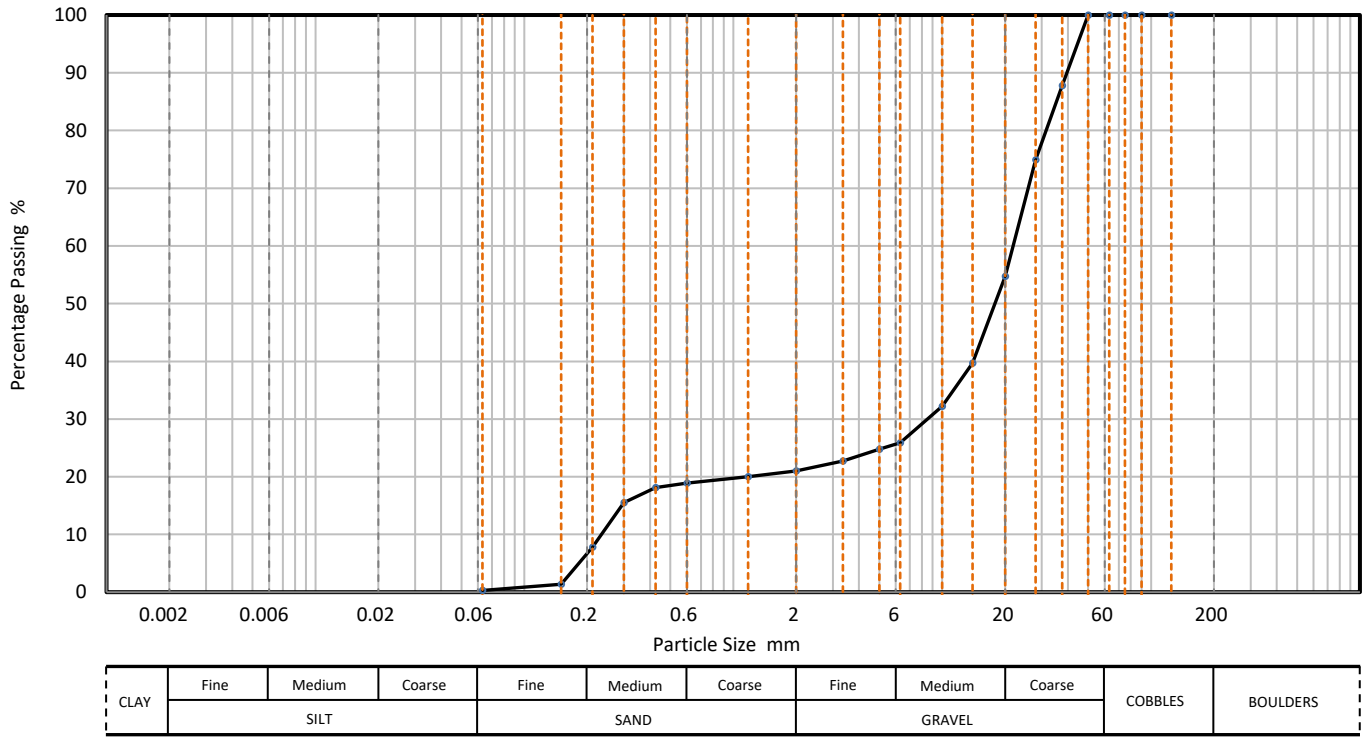
UKAS TESTING
10258

Hole	BHSP09	Lab sample ID	G2MT2023061928
Depth (Top) m	2.00	Test Method	BS 1377 - 2 : 1990 Clause 9.2
Depth (Base) m		Soil Description	Very Sandy, GRAVEL
Sample type	B		



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	88		
28	75		
20	55		
14	40		
10	32		
6.3	26		
5	25		
3.35	23		
2	21		
1.18	20		
0.6	19		
0.425	18		
0.3	16		
0.212	8		
0.15	1		
0.063	0		

Dry Mass of sample, g	3331

Sample Proportions	% dry mass
Very coarse	0.0
Gravel	79.0
Sand	20.7
Fines <0.063mm	0.0

Grading Analysis		
D100	mm	
D60	mm	21.8
D30	mm	8.52
D10	mm	0.234
Uniformity Coefficient		93
Curvature Coefficient		14

Remarks

Preparation and testing in accordance with test method unless noted below

Sample tested was deviating in accordance with BS1377 test standard

Accreditation status

Hydrometer is the usual Sedimentation method carried out by G2M Testing and is part of the G2M Testing UKAS accreditation schedule.

Approved by	D Anderson
Approval date	22/06/2023 10:47

PARTICLE SIZE DISTRIBUTION

Site name	Job number
Ardersier Port	S230503

G2M Testing (Stockton)
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Stockton on Tees,
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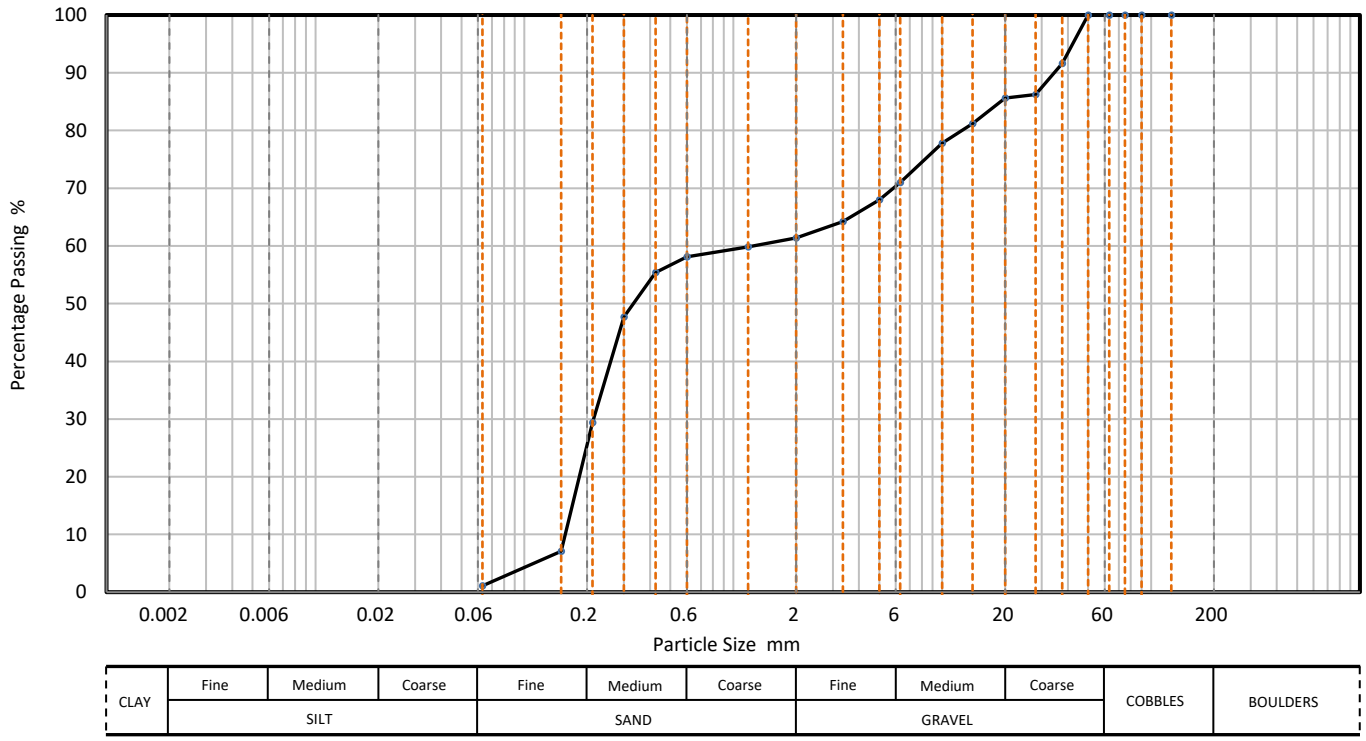
UKAS TESTING
10258

Hole	BHSP09	Lab sample ID	G2MT2023061931
Depth (Top) m	5.00	Test Method	BS 1377 - 2 : 1990 Clause 9.2
Depth (Base) m		Soil Description	Very slightly Silty, very Gravelly, SAND
Sample type	B		



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	92		
28	86		
20	86		
14	81		
10	78		
6.3	71		
5	68		
3.35	64		
2	61		
1.18	60		
0.6	58		
0.425	55		
0.3	48		
0.212	29		
0.15	7		
0.063	1		

Dry Mass of sample, g	2382

Sample Proportions	% dry mass
Very coarse	0.0
Gravel	38.6
Sand	60.2
Fines <0.063mm	1.0

Grading Analysis		
D100	mm	
D60	mm	1.24
D30	mm	0.214
D10	mm	0.157
Uniformity Coefficient		7.9
Curvature Coefficient		0.24

Remarks

Preparation and testing in accordance with test method unless noted below

Sample tested was deviating in accordance with BS1377 test standard

Accreditation status

Hydrometer is the usual Sedimentation method carried out by G2M Testing and is part of the G2M Testing UKAS accreditation schedule.

Approved by	D Anderson
Approval date	22/06/2023 10:34

PARTICLE SIZE DISTRIBUTION

Site name	Job number
Ardersier Port	S230503

G2M Testing (Stockton)
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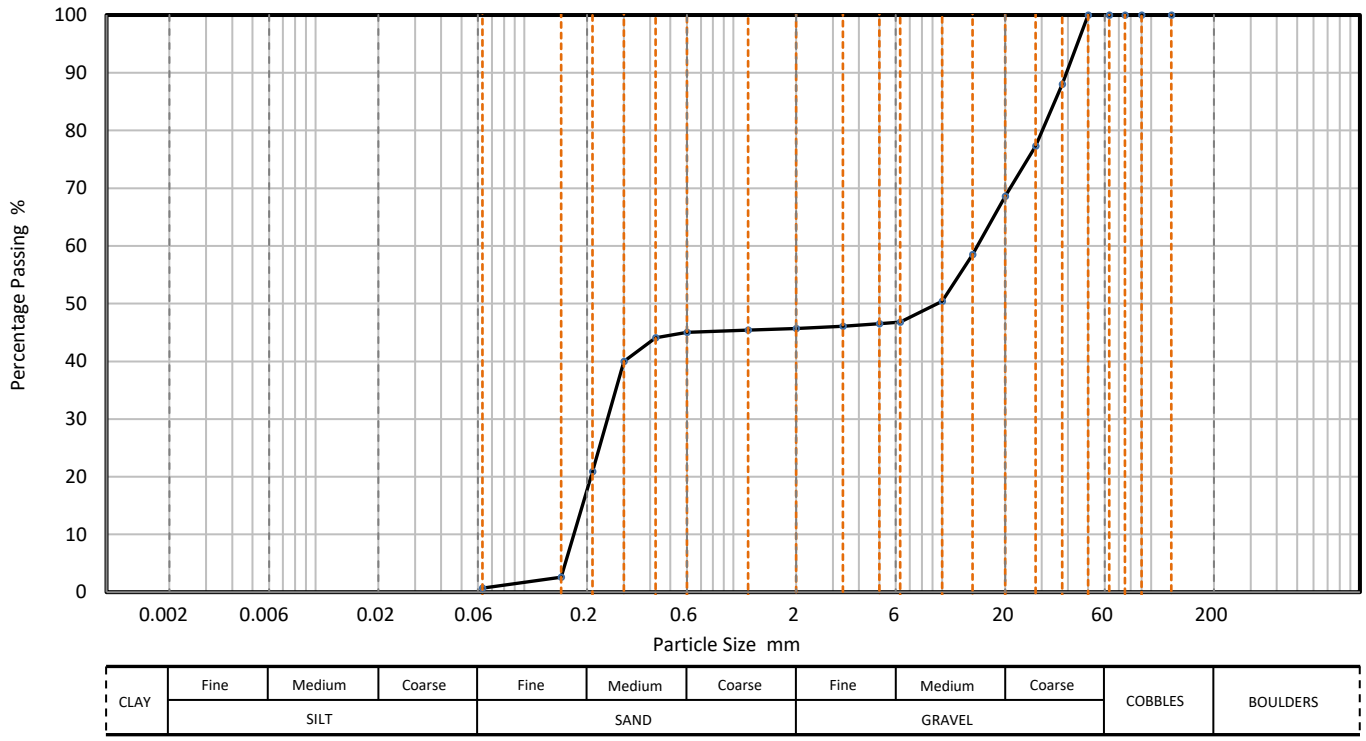
UKAS TESTING
10258

Hole		BHSP09	Lab sample ID	G2MT2023061933
Depth (Top)	m	8.00	Test Method	BS 1377 - 2 : 1990 Clause 9.2
Depth (Base)	m		Soil Description	Very slightly Silty, very Sandy, GRAVEL
Sample type		B		



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	88		
28	77		
20	69		
14	59		
10	50		
6.3	47		
5	47		
3.35	46		
2	46		
1.18	45		
0.6	45		
0.425	44		
0.3	40		
0.212	21		
0.15	3		
0.063	1		

Dry Mass of sample, g	4370

Sample Proportions	% dry mass
Very coarse	0.0
Gravel	54.3
Sand	45.0
Fines <0.063mm	1.0

Grading Analysis		
D100	mm	
D60	mm	14.8
D30	mm	0.25
D10	mm	0.173
Uniformity Coefficient		86
Curvature Coefficient		0.025

Remarks

Preparation and testing in accordance with test method unless noted below

Sample tested was deviating in accordance with BS1377 test standard

Accreditation status

Hydrometer is the usual Sedimentation method carried out by G2M Testing and is part of the G2M Testing UKAS accreditation schedule.

Approved by	D Anderson
Approval date	22/06/2023 10:43

PARTICLE SIZE DISTRIBUTION

Site name	Job number
Ardersier Port	S230503

G2M Testing (Stockton)
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Stockton on Tees,
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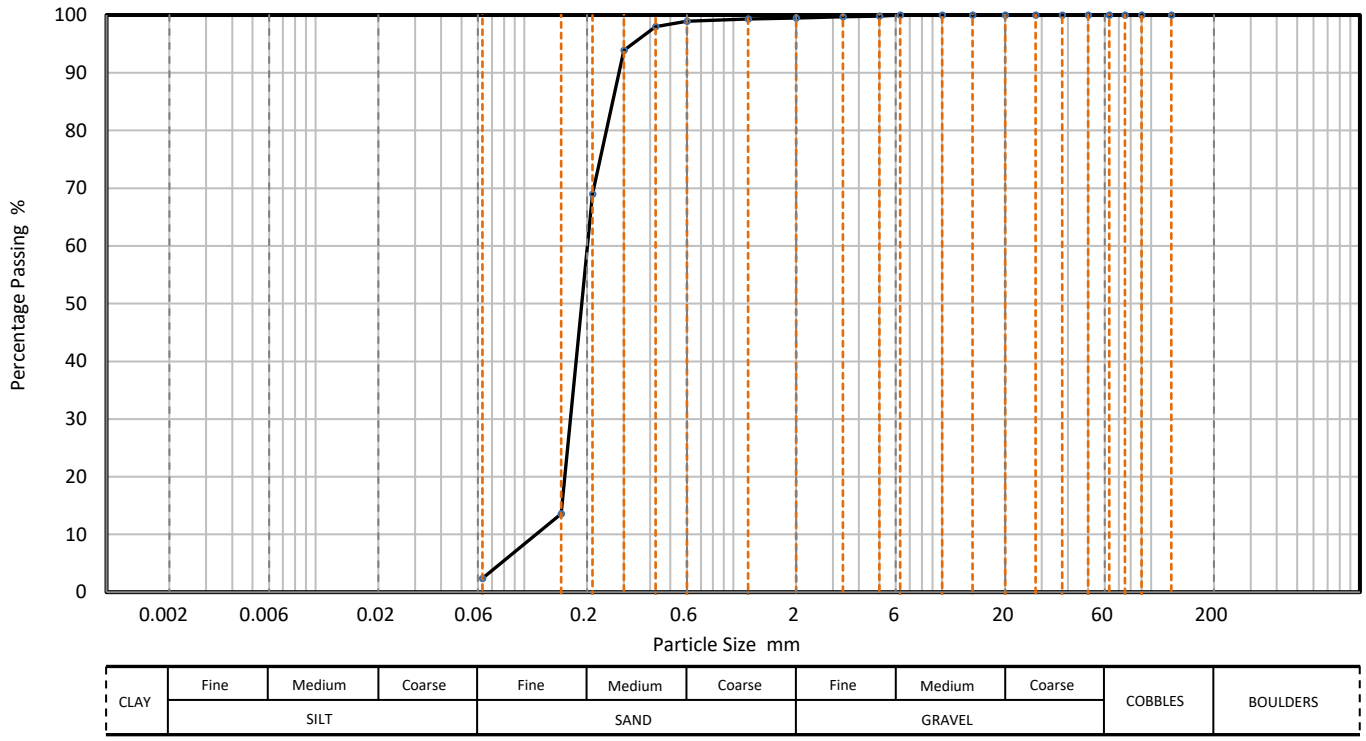
UKAS TESTING
10258

Hole	BHSP09	Lab sample ID	G2MT2023061934
Depth (Top) m	10.50	Test Method	BS 1377 - 2 : 1990 Clause 9.2
Depth (Base) m		Soil Description	Very slightly Gravelly, slightly Silty, SAND
Sample type	B		



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	100		
6.3	100		
5	100		
3.35	100		
2	100		
1.18	99		
0.6	99		
0.425	98		
0.3	94		
0.212	69		
0.15	14		
0.063	2		

Dry Mass of sample, g: 1531

Sample Proportions	% dry mass
Very coarse	0.0
Gravel	0.5
Sand	97.1
Fines <0.063mm	2.0

Grading Analysis		
D100	mm	
D60	mm	0.2
D30	mm	0.166
D10	mm	0.114
Uniformity Coefficient		1.8
Curvature Coefficient		1.2

Remarks
Preparation and testing in accordance with test method unless noted below

Accreditation status
Hydrometer is the usual Sedimentation method carried out by G2M Testing and is part of the G2M Testing UKAS accreditation schedule.

Approved by	D Anderson
Approval date	22/06/2023 10:38

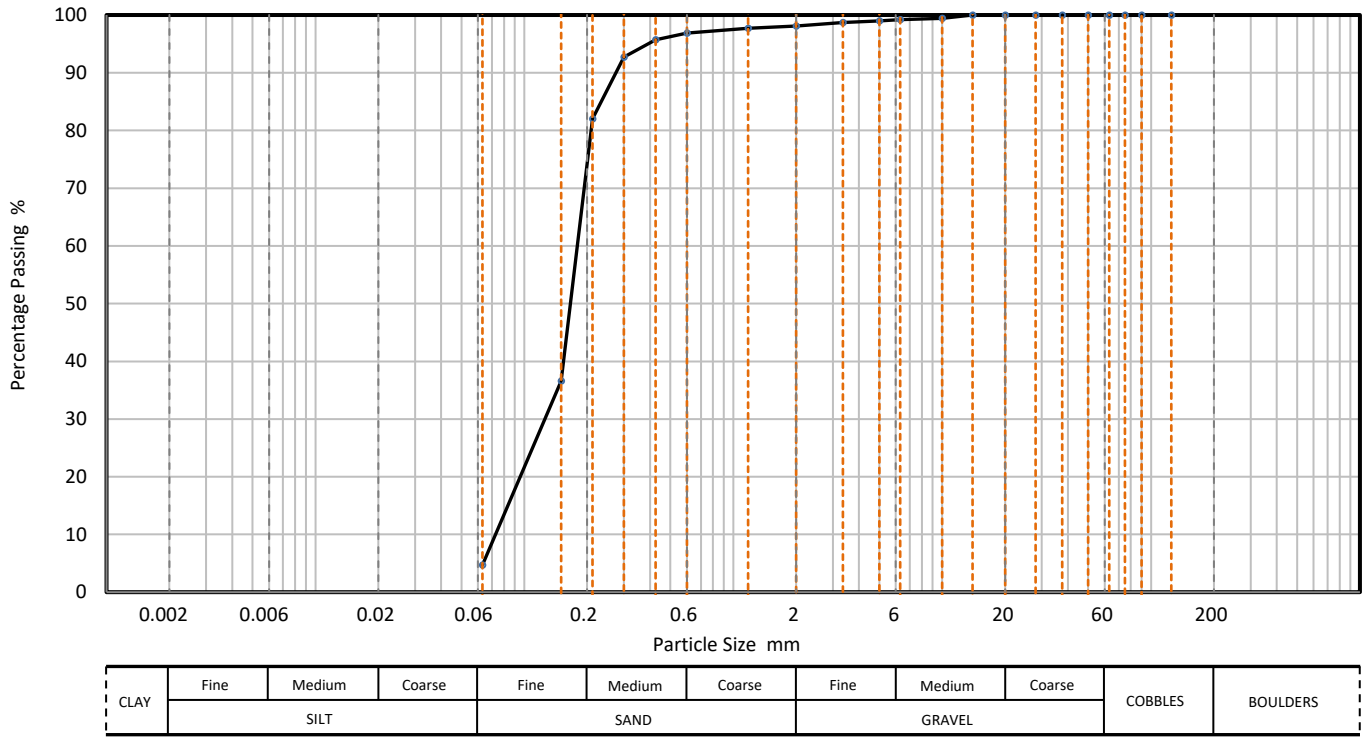
PARTICLE SIZE DISTRIBUTION

Site name	Job number
Ardersier Port	S230503

G2M Testing (Stockton)
12-16 Yarm Road,
Stockton on Tees,
TS18 3NA
01642 033318
info@g2mtesting.co.uk

UKAS TESTING
10258

Hole	BHSP09	Lab sample ID	G2MT2023061935
Depth (Top) m	13.50	Test Method	BS 1377 - 2 : 1990 Clause 9.2
Depth (Base) m		Soil Description	Slightly Gravelly, slightly Silty, SAND
Sample type	B		



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	99		
6.3	99		
5	99		
3.35	99		
2	98		
1.18	98		
0.6	97		
0.425	96		
0.3	93		
0.212	82		
0.15	37		
0.063	5		

Dry Mass of sample, g: 1703

Sample Proportions	% dry mass
Very coarse	0.0
Gravel	1.9
Sand	93.4
Fines <0.063mm	5.0

Grading Analysis		
D100	mm	
D60	mm	0.179
D30	mm	0.125
D10	mm	0.0727
Uniformity Coefficient		2.5
Curvature Coefficient		1.2

Remarks
Preparation and testing in accordance with test method unless noted below

Accreditation status
Hydrometer is the usual Sedimentation method carried out by G2M Testing and is part of the G2M Testing UKAS accreditation schedule.

Approved by	D Anderson
Approval date	23/06/2023 08:36

PARTICLE SIZE DISTRIBUTION

Site name	Job number
Ardersier Port	S230503

G2M Testing (Stockton)
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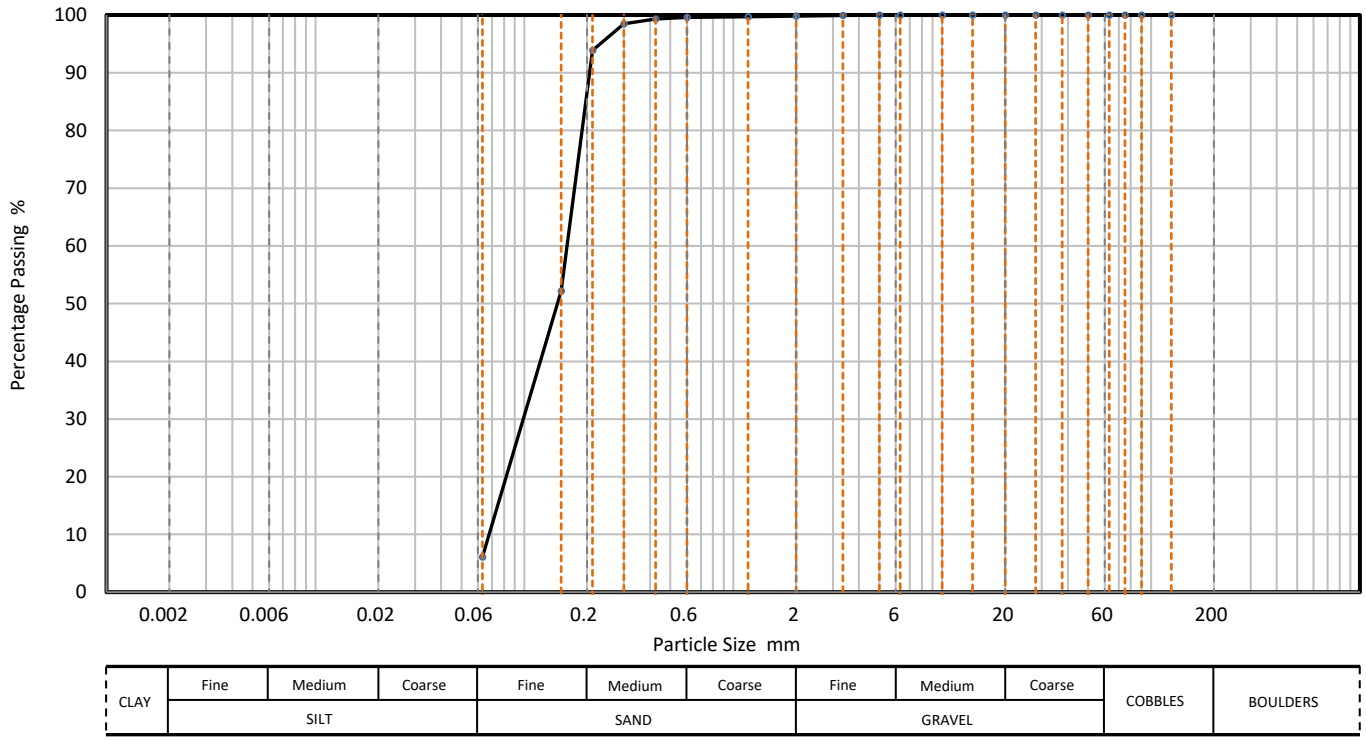
UKAS TESTING
10258

Hole	BHSP09	Lab sample ID	G2MT2023061936
Depth (Top) m	16.50	Test Method	BS 1377 - 2 : 1990 Clause 9.2
Depth (Base) m		Soil Description	Very slightly Gravelly, slightly Silty, SAND
Sample type	B		



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	100		
6.3	100		
5	100		
3.35	100		
2	100		
1.18	100		
0.6	100		
0.425	99		
0.3	99		
0.212	94		
0.15	52		
0.063	6		

Dry Mass of sample, g: 1553

Sample Proportions	% dry mass
Very coarse	0.0
Gravel	0.2
Sand	93.7
Fines <0.063mm	6.0

Grading Analysis		
D100	mm	
D60	mm	0.16
D30	mm	0.0988
D10	mm	0.0678
Uniformity Coefficient		2.4
Curvature Coefficient		0.9

Remarks

Preparation and testing in accordance with test method unless noted below

Accreditation status

Hydrometer is the usual Sedimentation method carried out by G2M Testing and is part of the G2M Testing UKAS accreditation schedule.

Approved by	D Anderson
Approval date	23/06/2023 08:44

PARTICLE SIZE DISTRIBUTION

Site name	Job number
Ardersier Port	S230503

G2M Testing (Stockton)
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Stockton on Tees,
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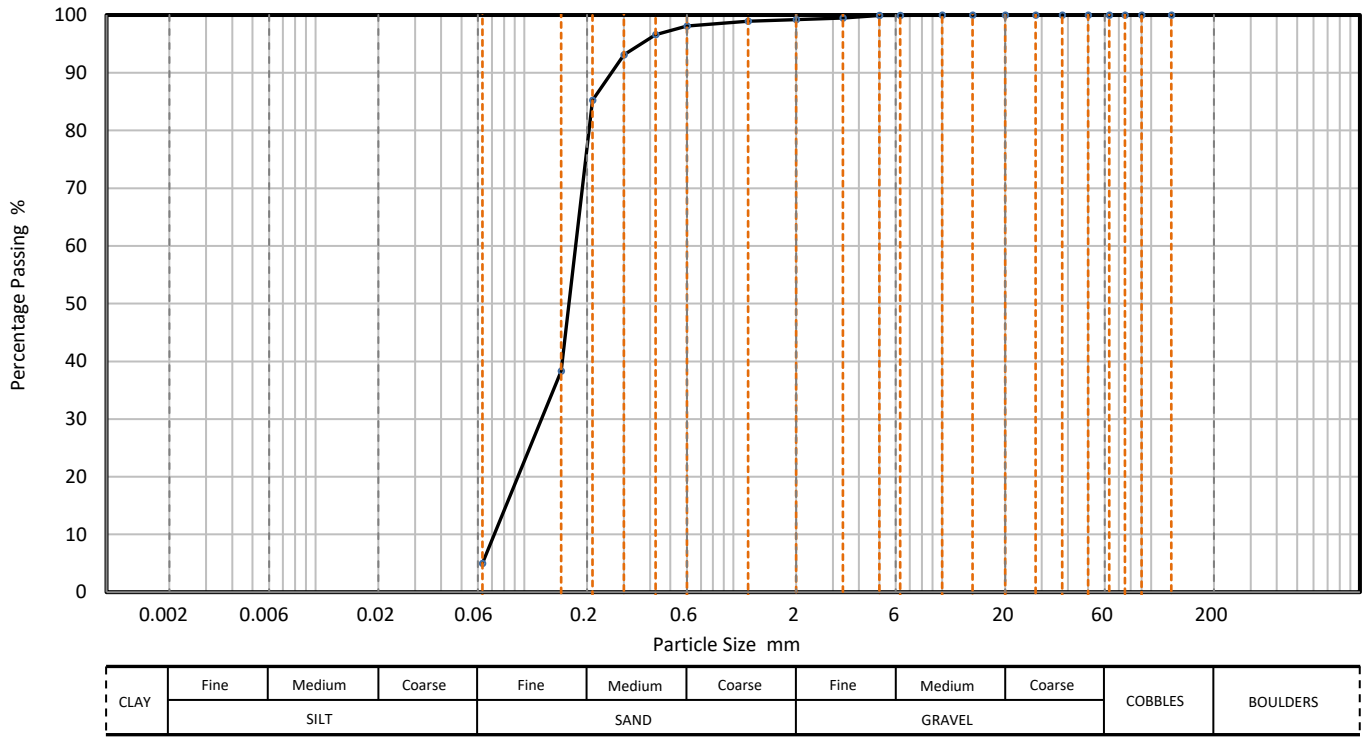
UKAS TESTING
10258

Hole	BHSP09	Lab sample ID	G2MT2023061937
Depth (Top) m	19.50	Test Method	BS 1377 - 2 : 1990 Clause 9.2
Depth (Base) m		Soil Description	Very slightly Gravelly, slightly Silty, SAND
Sample type	B		



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	100		
6.3	100		
5	100		
3.35	100		
2	99		
1.18	99		
0.6	98		
0.425	97		
0.3	93		
0.212	85		
0.15	38		
0.063	5		

Dry Mass of sample, g: 1286

Sample Proportions	% dry mass
Very coarse	0.0
Gravel	0.8
Sand	94.2
Fines <0.063mm	5.0

Grading Analysis		
D100	mm	
D60	mm	0.176
D30	mm	0.121
D10	mm	0.0718
Uniformity Coefficient		2.5
Curvature Coefficient		1.2

Remarks
Preparation and testing in accordance with test method unless noted below

Accreditation status
Hydrometer is the usual Sedimentation method carried out by G2M Testing and is part of the G2M Testing UKAS accreditation schedule.

Approved by	D Anderson
Approval date	23/06/2023 09:12

PARTICLE SIZE DISTRIBUTION

Site name	Job number
Ardersier Port	S230503

G2M Testing (Stockton)
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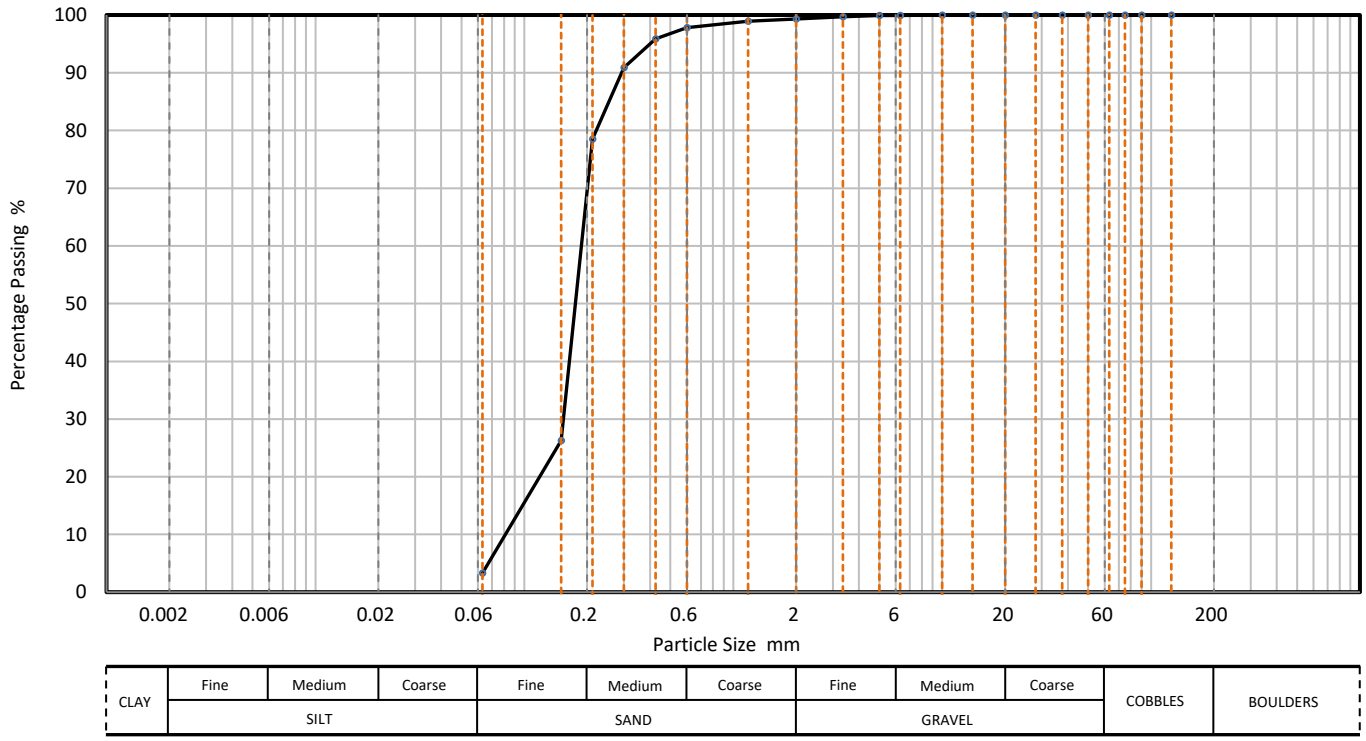
UKAS TESTING
10258

Hole	BHSP09	Lab sample ID	G2MT2023061938
Depth (Top) m	22.50	Test Method	BS 1377 - 2 : 1990 Clause 9.2
Depth (Base) m		Soil Description	Very slightly Gravelly, slightly Silty, SAND
Sample type	B		



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	100		
6.3	100		
5	100		
3.35	100		
2	99		
1.18	99		
0.6	98		
0.425	96		
0.3	91		
0.212	79		
0.15	26		
0.063	3		

Dry Mass of sample, g: 1417

Sample Proportions	% dry mass
Very coarse	0.0
Gravel	0.7
Sand	95.9
Fines <0.063mm	3.0

Grading Analysis		
D100	mm	
D60	mm	0.188
D30	mm	0.154
D10	mm	0.081
Uniformity Coefficient		2.3
Curvature Coefficient		1.6

Remarks
Preparation and testing in accordance with test method unless noted below

Accreditation status
Hydrometer is the usual Sedimentation method carried out by G2M Testing and is part of the G2M Testing UKAS accreditation schedule.

Approved by	D Anderson
Approval date	23/06/2023 08:31

PARTICLE SIZE DISTRIBUTION

Site name	Job number
Ardersier Port	S230503

G2M Testing (Stockton)
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Stockton on Tees,
TS18 3NA
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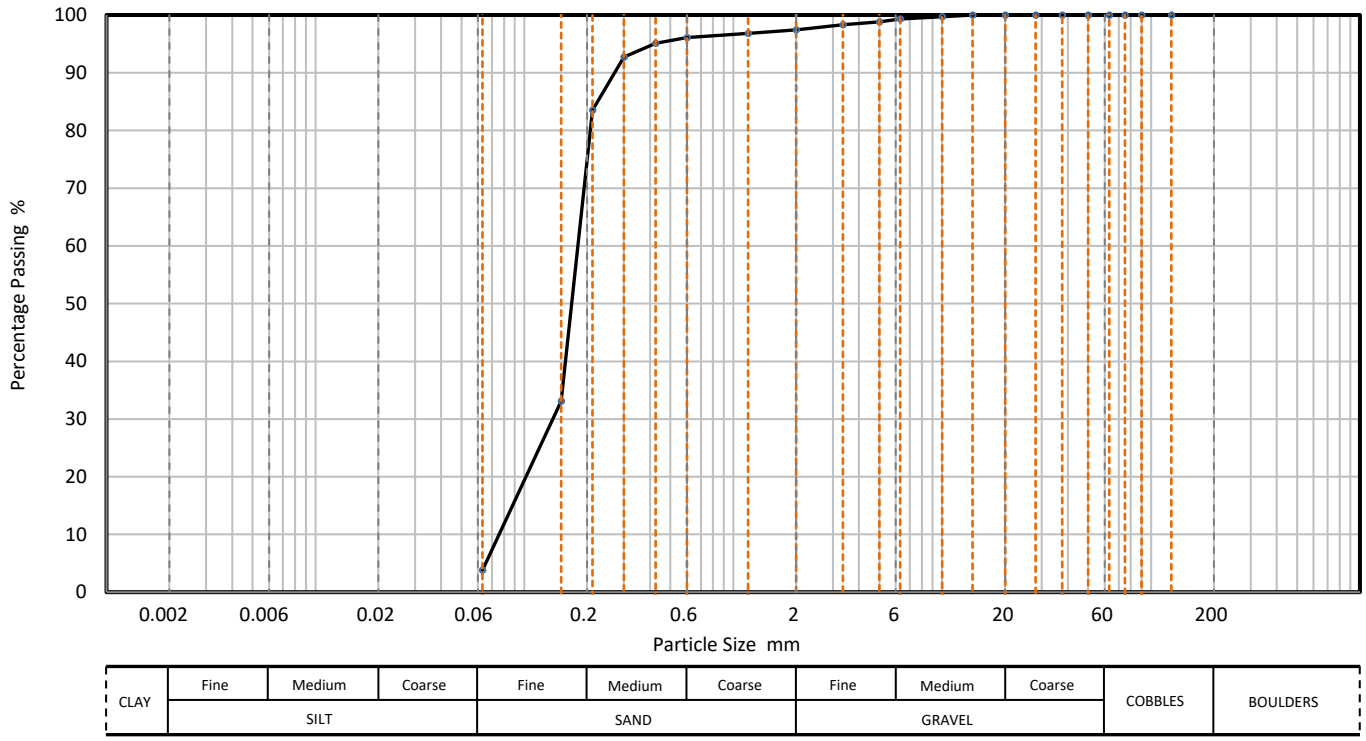
info@g2mtesting.co.uk

UKAS TESTING
10258

Hole	BHSP09	Lab sample ID	G2MT2023061939
Depth (Top) m	24.00	Test Method	BS 1377 - 2 : 1990 Clause 9.2
Depth (Base) m		Soil Description	Slightly Gravelly, slightly Silty, SAND
Sample type	B		



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	100		
6.3	99		
5	99		
3.35	98		
2	97		
1.18	97		
0.6	96		
0.425	95		
0.3	93		
0.212	84		
0.15	33		
0.063	4		

Dry Mass of sample, g: 1565

Sample Proportions	% dry mass
Very coarse	0.0
Gravel	2.6
Sand	93.6
Fines <0.063mm	4.0

Grading Analysis		
D100	mm	
D60	mm	0.18
D30	mm	0.137
D10	mm	0.0757
Uniformity Coefficient		2.4
Curvature Coefficient		1.4

Remarks
Preparation and testing in accordance with test method unless noted below

Accreditation status
Hydrometer is the usual Sedimentation method carried out by G2M Testing and is part of the G2M Testing UKAS accreditation schedule.

Approved by	D Anderson
Approval date	22/06/2023 10:30

PARTICLE SIZE DISTRIBUTION

Site name	Job number
Ardersier Port	S230503

G2M Testing (Stockton)
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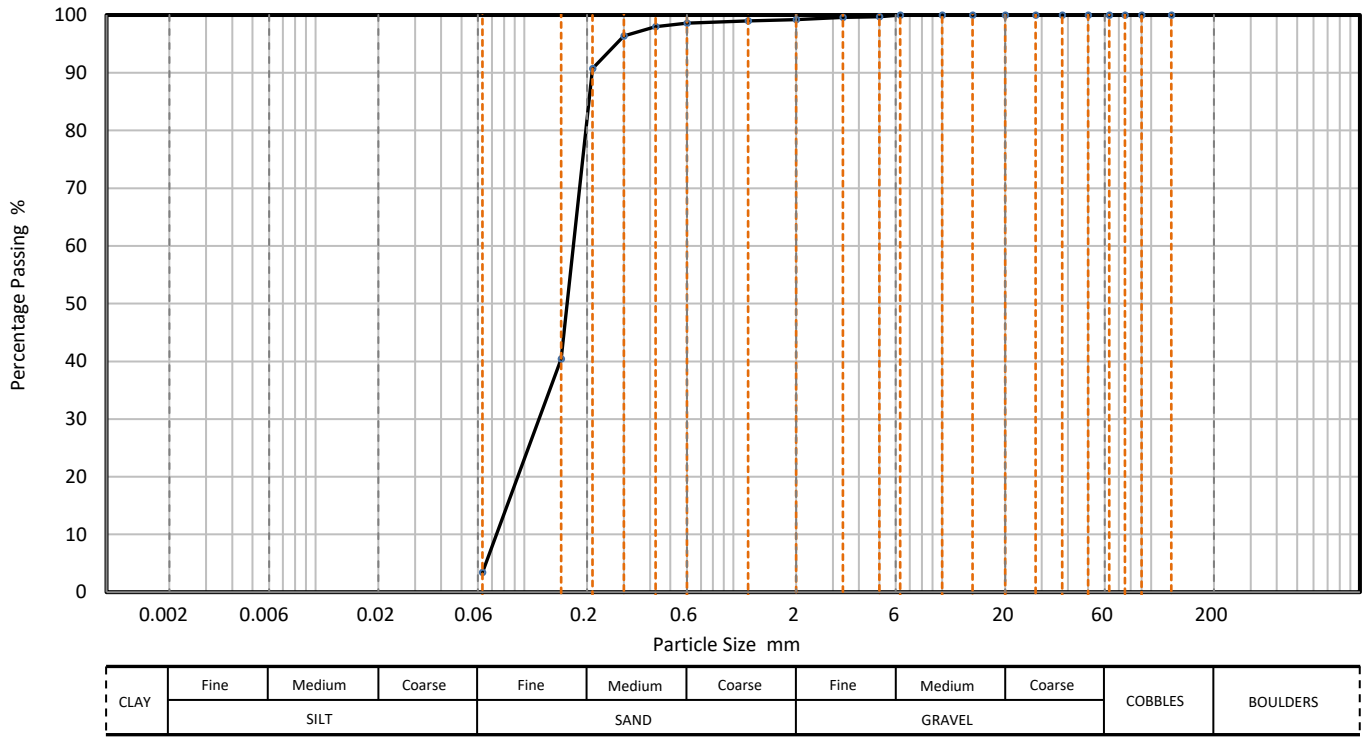
UKAS TESTING
10258

Hole	BHSP09	Lab sample ID	G2MT2023061940
Depth (Top) m	27.00	Test Method	BS 1377 - 2 : 1990 Clause 9.2
Depth (Base) m		Soil Description	Very slightly Gravelly, slightly Silty, SAND
Sample type	B		



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	100		
6.3	100		
5	100		
3.35	100		
2	99		
1.18	99		
0.6	99		
0.425	98		
0.3	96		
0.212	91		
0.15	40		
0.063	3		

Dry Mass of sample, g: 1762

Sample Proportions	% dry mass
Very coarse	0.0
Gravel	0.8
Sand	95.8
Fines <0.063mm	3.0

Grading Analysis		
D100	mm	
D60	mm	0.172
D30	mm	0.118
D10	mm	0.0735
Uniformity Coefficient		2.3
Curvature Coefficient		1.1

Remarks
Preparation and testing in accordance with test method unless noted below

Accreditation status
Hydrometer is the usual Sedimentation method carried out by G2M Testing and is part of the G2M Testing UKAS accreditation schedule.

Approved by	D Anderson
Approval date	22/06/2023 10:51

PARTICLE SIZE DISTRIBUTION

Site name	Job number
Ardersier Port	S230503

G2M Testing (Stockton)
12-16 Yarm Road,
Stockton on Tees,
TS18 3NA
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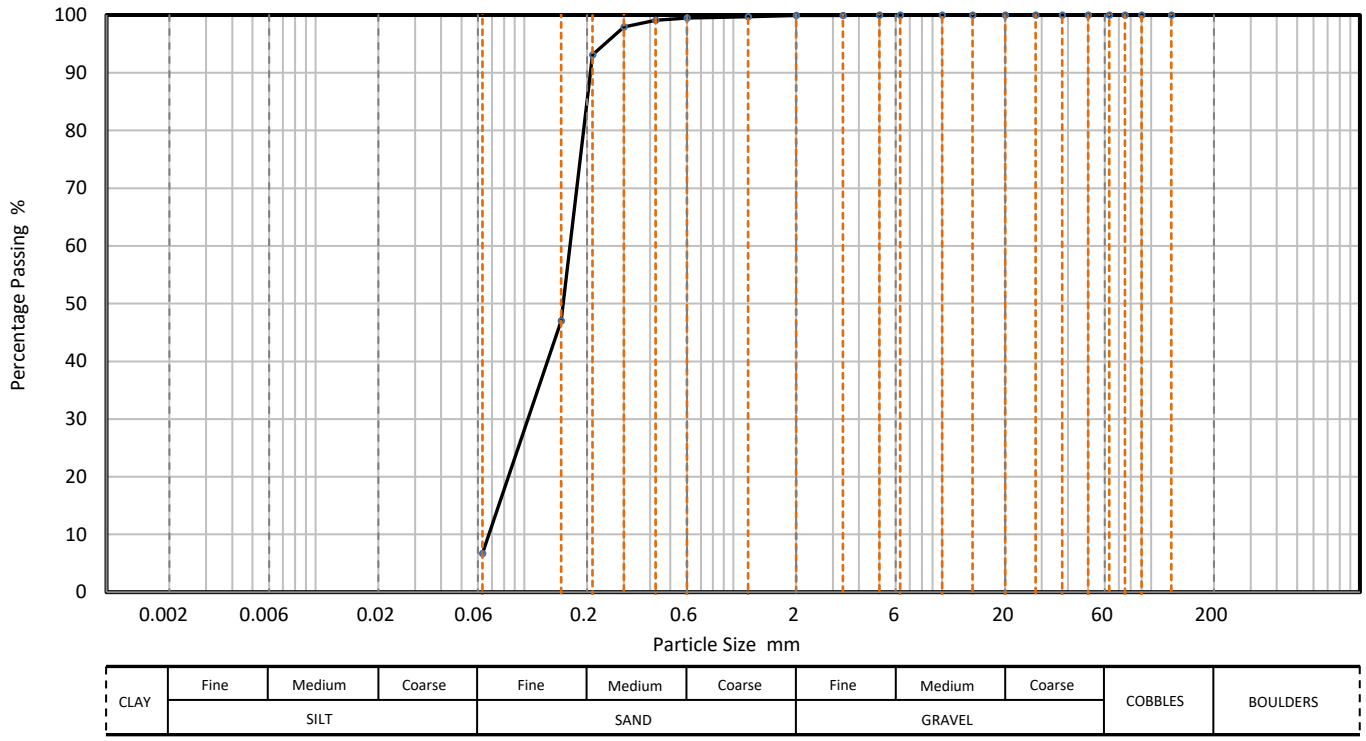
UKAS TESTING
10258

Hole	BHSP09	Lab sample ID	G2MT2023061941
Depth (Top) m	30.00	Test Method	BS 1377 - 2 : 1990 Clause 9.2
Depth (Base) m		Soil Description	Very slightly Gravelly, slightly Silty, SAND
Sample type	B		



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	100		
6.3	100		
5	100		
3.35	100		
2	100		
1.18	100		
0.6	100		
0.425	99		
0.3	98		
0.212	93		
0.15	47		
0.063	7		

Dry Mass of sample, g	1503

Sample Proportions	% dry mass
Very coarse	0.0
Gravel	0.1
Sand	93.2
Fines <0.063mm	7.0

Grading Analysis		
D100	mm	
D60	mm	0.165
D30	mm	0.104
D10	mm	0.0677
Uniformity Coefficient		2.4
Curvature Coefficient		0.97

Remarks
Preparation and testing in accordance with test method unless noted below

Accreditation status
Hydrometer is the usual Sedimentation method carried out by G2M Testing and is part of the G2M Testing UKAS accreditation schedule.

Approved by	D Anderson
Approval date	23/06/2023 09:17

PARTICLE SIZE DISTRIBUTION

Site name	Job number
Ardersier Port	S230503

G2M Testing (Stockton)
12-16 Yarm Road,
Stockton on Tees,
TS18 3NA
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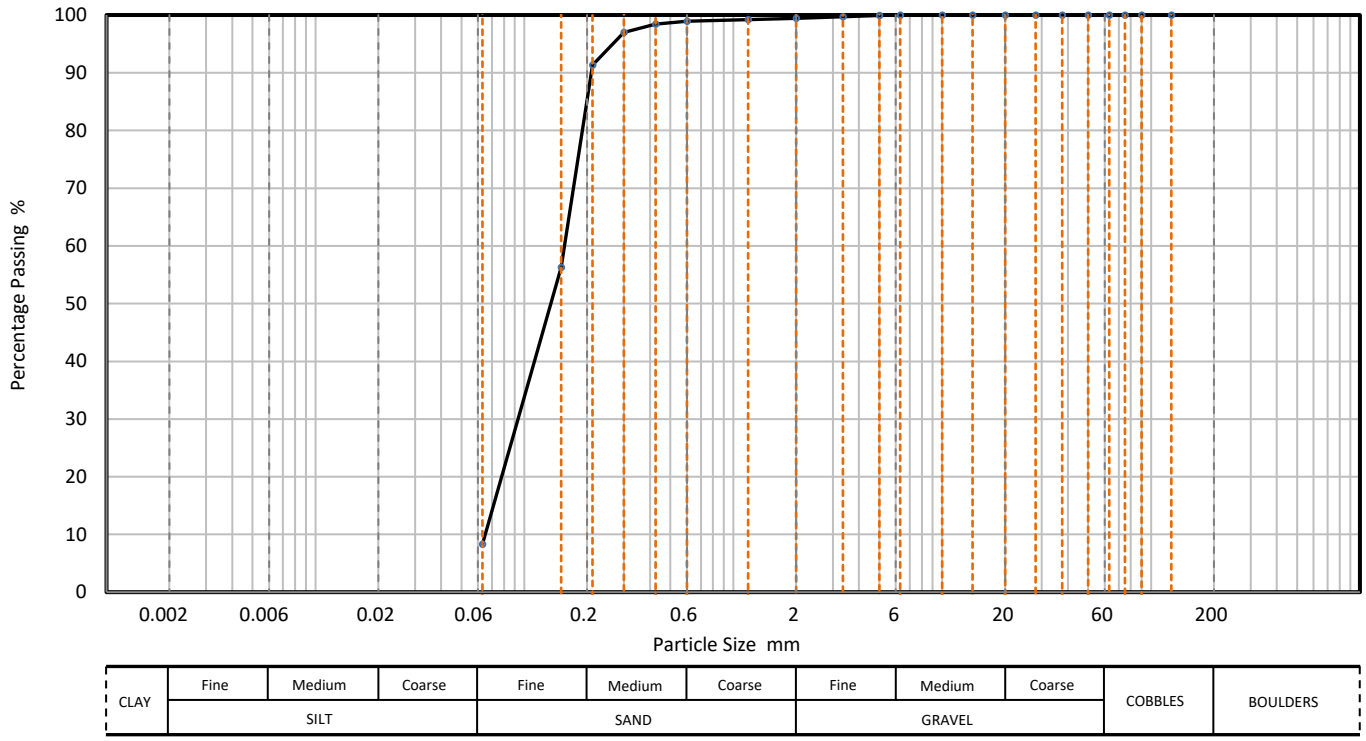
UKAS TESTING
10258

Hole	BHSP09	Lab sample ID	G2MT2023061942
Depth (Top) m	33.00	Test Method	BS 1377 - 2 : 1990 Clause 9.2
Depth (Base) m		Soil Description	Very slightly Gravelly, slightly Silty, SAND
Sample type	B		



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	100		
6.3	100		
5	100		
3.35	100		
2	99		
1.18	99		
0.6	99		
0.425	98		
0.3	97		
0.212	91		
0.15	56		
0.063	8		

Dry Mass of sample, g: 1639

Sample Proportions	% dry mass
Very coarse	0.0
Gravel	0.6
Sand	91.1
Fines <0.063mm	8.0

Grading Analysis		
D100	mm	
D60	mm	0.156
D30	mm	0.0933
D10	mm	0.065
Uniformity Coefficient		2.4
Curvature Coefficient		0.86

Remarks
Preparation and testing in accordance with test method unless noted below

Accreditation status
Hydrometer is the usual Sedimentation method carried out by G2M Testing and is part of the G2M Testing UKAS accreditation schedule.

Approved by	D Anderson
Approval date	22/06/2023 08:02

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Solmek
12 Yarm Road
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TS18 3NA

16 October 2023
Report No : GEO/38553/01

For the attention of Mr A Cutts

Date samples received	27/07/2023
Date written instructions received	28/07/2023
Date testing commenced	29/07/2023
Date of sample disposal	**13/11/2023**

Our ref **GEO / 38553**
Your Ref **S23053**

Project **ARDERSIER PORT**

Further to your instructions we have pleasure in enclosing the results of the tests you requested in the attached figures.

LABORATORY TEST REPORT

Item No	Test Quantity	Description
1	4	Maximum & Minimum Density
2	2	Shear Strength by Direct Shear
3	2	Isotropic Consolidated Drained Triaxial Compression (CID) - remoulded

Any opinions or interpretations expressed herein are outside the scope of UKAS accreditation. All results contained in this report are provisional unless signed by an approved signatory. The results contained in this report relate only to samples received in the laboratory and are tested 'as received' unless otherwise stated. This report should not be reproduced, except in full, without the written approval of the laboratory. The results reported are applicable only to the test items received by the laboratory.

All the necessary data required by the documented test procedures has been recorded and will be stored for a period of not less than 6 years. This data will be issued to yourselves at your request. All samples will be disposed of after the date shown above. Written confirmation will be required to retain the samples beyond this period and a storage charge may be applied.

We trust that the above meets your requirements and should you require any further information or assistance, please do not hesitate to contact us.

Yours faithfully
on behalf of **GEOLABS Limited**

J Sturges
Operations Manager

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Determination of Maximum and Minimum Dry Density of Sands

NGI-Geolabs Recommended Method Statement (As published in 'Development of new robust procedures for the determination of maximum and minimum dry densities of sand' by Knudsen.S et al at ISFOG 2020 {delayed publication})

Location	BHSP05
Depth (m)	8.00-8.45
Sample Type	B

Description:

Greyish brown fine to medium SAND with rare fine to medium gravel.

Percentage of material retained on the 2 mm test sieve	0.5	%

The fines content was measured to be 1.1 %, so within the 12 % permitted fines

Maximum Dry Density

Mean Maximum Dry Density 1.62 g/cm³

(after surcharge application)

Determination No 1

Maximum dry density **before** surcharge application	1.610	g/cm³
Maximum dry density **after** surcharge application	1.622	g/cm³
Shaker amplitude setting **before** surcharge application	2	
Shaker amplitude setting **after** surcharge application	2	

Determination No 2

Maximum dry density **before** surcharge application	1.610	g/cm³
Maximum dry density **after** surcharge application	1.625	g/cm³
Shaker amplitude setting **before** surcharge application	2	
Shaker amplitude setting **after** surcharge application	2	

Minimum Dry Density

Minimum Dry Density 1.26 g/cm³

Water calibrated volume of the mould		443.90	cm³
Mass of the mould		897.13	g
	Run		
Mass of sand	1	558.89	g
	2	556.98	g
	3	557.25	g
	4	556.67	g
	5	557.88	g
	Minimum	557.53	g

Checked and Approved by

J Powell - Technical Consultant
23/08/2023

Project Number:

38553

Project Name:

ARDERSIER PORT
S23053

GEOLABS®

Determination of Maximum and Minimum Dry Density of Sands

NGI-Geolabs Recommended Method Statement (As published in 'Development of new robust procedures for the determination of maximum and minimum dry densities of sand' by Knudsen.S et al at ISFOG 2020 {delayed publication})

Location	BHSP05
Depth (m)	10.00-10.45
Sample Type	B

Description:

Greyish brown fine to medium SAND with occasional fine to medium gravel.

Percentage of material retained on the 2 mm test sieve	0.4	%

The fines content was measured to be 0.7 %, so within the 12 % permitted fines

Maximum Dry Density

Mean Maximum Dry Density (after surcharge application)	**1.55**	**g/cm³**

Determination No 1

Maximum dry density **before** surcharge application	1.548	g/cm³
Maximum dry density **after** surcharge application	1.557	g/cm³
Shaker amplitude setting **before** surcharge application	2	
Shaker amplitude setting **after** surcharge application	2	

Determination No 2

Maximum dry density **before** surcharge application	1.536	g/cm³
Maximum dry density **after** surcharge application	1.550	g/cm³
Shaker amplitude setting **before** surcharge application	2	
Shaker amplitude setting **after** surcharge application	2	

Minimum Dry Density

Minimum Dry Density		**1.20**	**g/cm³**
Water calibrated volume of the mould		443.90	cm³
Mass of the mould		897.11	g
	Run		
Mass of sand	1	529.56	g
	2	530.84	g
	3	530.62	g
	4	530.89	g
	5	530.88	g
	Minimum	530.56	g

Checked and Approved by

J Powell - Technical Consultant
23/08/2023

Project Number:

38553

Project Name:

ARDERSIER PORT
S23053

GEOLABS®

Determination of Maximum and Minimum Dry Density of Sands

NGI-Geolabs Recommended Method Statement (As published in 'Development of new robust procedures for the determination of maximum and minimum dry densities of sand' by Knudsen.S et al at ISFOG 2020 {delayed publication})

Location	BHSP05
Depth (m)	16.50-16.95
Sample Type	B

Description:

Brownish grey slightly silty fine to medium SAND with rare shell fragments and fine gravel.

Percentage of material retained on the 2 mm test sieve	0.1	%

The fines content was measured to be 3.5 %, so within the 12 % permitted fines

Maximum Dry Density

Mean Maximum Dry Density 1.54 g/cm³

(after surcharge application)

Determination No 1

Maximum dry density **before** surcharge application	1.522	g/cm³
Maximum dry density **after** surcharge application	1.536	g/cm³
Shaker amplitude setting **before** surcharge application	2	
Shaker amplitude setting **after** surcharge application	2	

Determination No 2

Maximum dry density **before** surcharge application	1.536	g/cm³
Maximum dry density **after** surcharge application	1.548	g/cm³
Shaker amplitude setting **before** surcharge application	2	
Shaker amplitude setting **after** surcharge application	2	

Minimum Dry Density

Minimum Dry Density 1.13 g/cm³

Water calibrated volume of the mould		443.90	cm³
Mass of the mould		897.11	g
	Run		
Mass of sand	1	499.56	g
	2	501.90	g
	3	502.90	g
	4	502.42	g
	5	501.29	g
	Minimum	501.61	g

Checked and Approved by

J Powell - Technical Consultant
23/08/2023

Project Number:

38553

Project Name:

ARDERSIER PORT
S23053

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Determination of Maximum and Minimum Dry Density of Sands

NGI-Geolabs Recommended Method Statement (As published in 'Development of new robust procedures for the determination of maximum and minimum dry densities of sand' by Knudsen.S et al at ISFOG 2020 {delayed publication})

Location	BHSP05
Depth (m)	19.50-19.95
Sample Type	B

Description:

Brownish grey slightly silty fine to medium SAND.

Percentage of material retained on the 2 mm test sieve	0.0	%

The fines content was measured to be 2.9 %, so within the 12 % permitted fines

Maximum Dry Density

Mean Maximum Dry Density — 1.55 g/cm³

(after surcharge application)

Determination No 1

Maximum dry density **before** surcharge application	1.527	g/cm³
Maximum dry density **after** surcharge application	1.543	g/cm³
Shaker amplitude setting **before** surcharge application	2	
Shaker amplitude setting **after** surcharge application	2	

Determination No 2

Maximum dry density **before** surcharge application	1.542	g/cm³
Maximum dry density **after** surcharge application	1.557	g/cm³
Shaker amplitude setting **before** surcharge application	2	
Shaker amplitude setting **after** surcharge application	2	

Minimum Dry Density

Minimum Dry Density — 1.15 g/cm³

Water calibrated volume of the mould		443.90	cm³
Mass of the mould		897.11	g
	Run		
Mass of sand	1	507.42	g
	2	509.87	g
	3	511.23	g
	4	510.50	g
	5	509.77	g
	Minimum	509.76	g

Checked and Approved by

J Powell - Technical Consultant
23/08/2023

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BS EN ISO 17892 10:2018

DIRECT SHEAR TEST – SHEARBOX

(small shearbox apparatus)

Borehole No	BHSP05
Depth (m)	8.00-8.45
Sample Type	B

Description:

Greyish brown slightly gravelly fine to medium SAND.

Specimen Details

Depth within original sample	*m*	n/a
Orientation within original sample		n/a
Test condition		Submerged
Preparation		< 2 mm material remoulded at existing water content to a relative density of 75% [1]
Particle density	*Mg/m³*	2.65 (assumed)

Specimen Number		**1**	**2**	**3**
Length	*mm*	59.78	60.00	60.06
Width	*mm*	59.77	59.98	59.99
Height	*mm*	22.48	22.37	22.38
Initial water content	*%*	23.4	23.4	23.4
Initial bulk density	*Mg/m³*	1.87	1.86	1.86
Initial dry density	*Mg/m³*	1.51	1.51	1.51
Initial voids ratio		0.752	0.756	0.758
Degree of Saturation	*%*	82.6	82.2	81.9

Shearing Stage

Normal stress	*kPa*	35	70	140
Peak Conditions:				
Rate of horizontal displacement	*mm/min*	0.18	0.18	0.18
Maximum shear stress	*kPa*	23.8	48.5	93.3
Horizontal displacement at MSS	*mm*	3.3	1.6	1.3
Vertical Displacement at Peak	*mm*	-0.25	-0.06	-0.06
Final water content	*%*	28.5	27.2	25.1
Duration	*day(s)*	1	1	1

Shear Strength Parameters

		Peak Condition
Apparent Cohesion	*kPa*	**1**
Angle of Shearing Resistance	*degrees*	**33.5**

Notes: *[1] Maximum dry density = 1.62 Mg/m³ and minimum dry density = 1.26 Mg/m³*

Tested by JJR
Checked and Approved by

C F Wallace - Technical Director
20/09/2023

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DIRECT SHEAR TEST – SHEARBOX

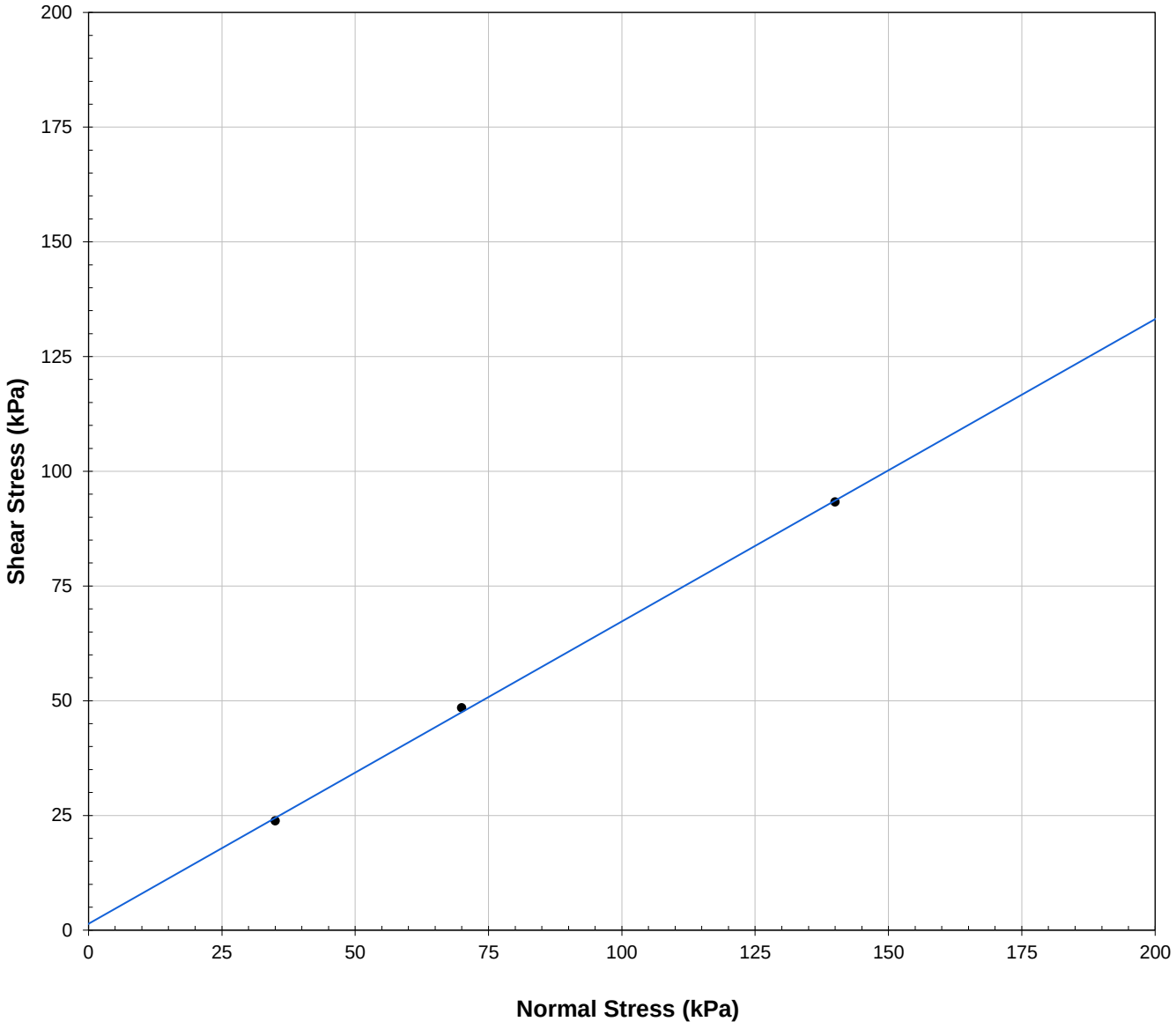
(small shearbox apparatus)

Borehole No	BHSP05
Depth (m)	8.00-8.45
Sample Type	B

Description:

Greyish brown slightly gravelly fine to medium SAND.

Shear Stress v Normal Stress



Peak: **c' = 1**

Φ' = 33.5

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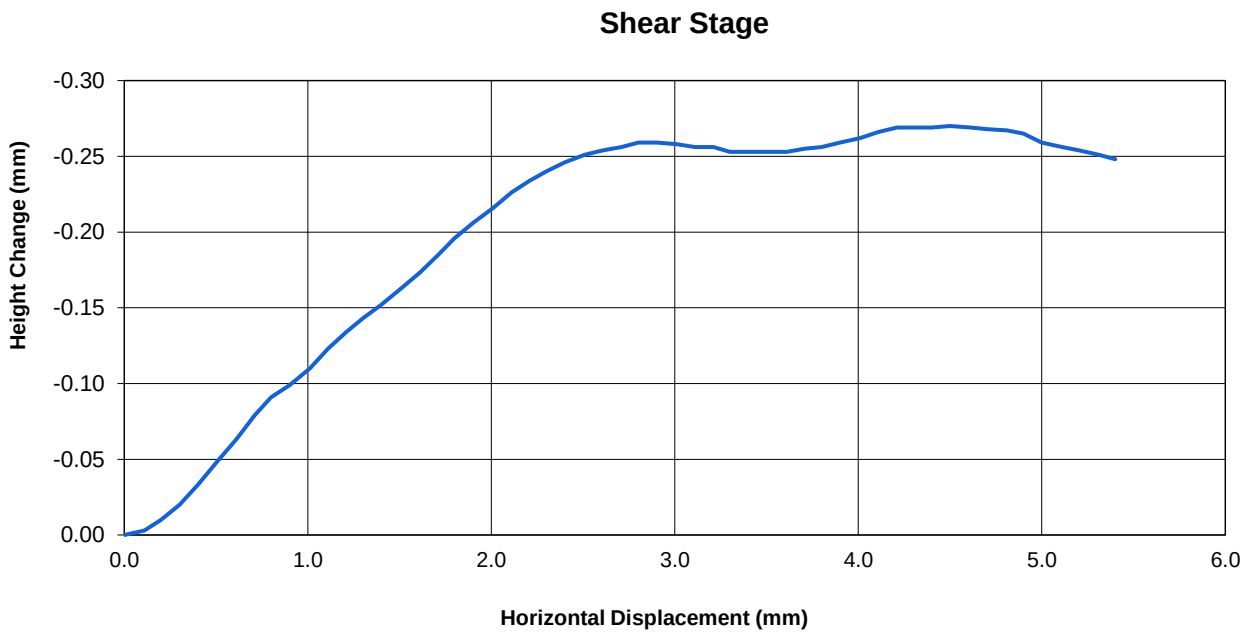
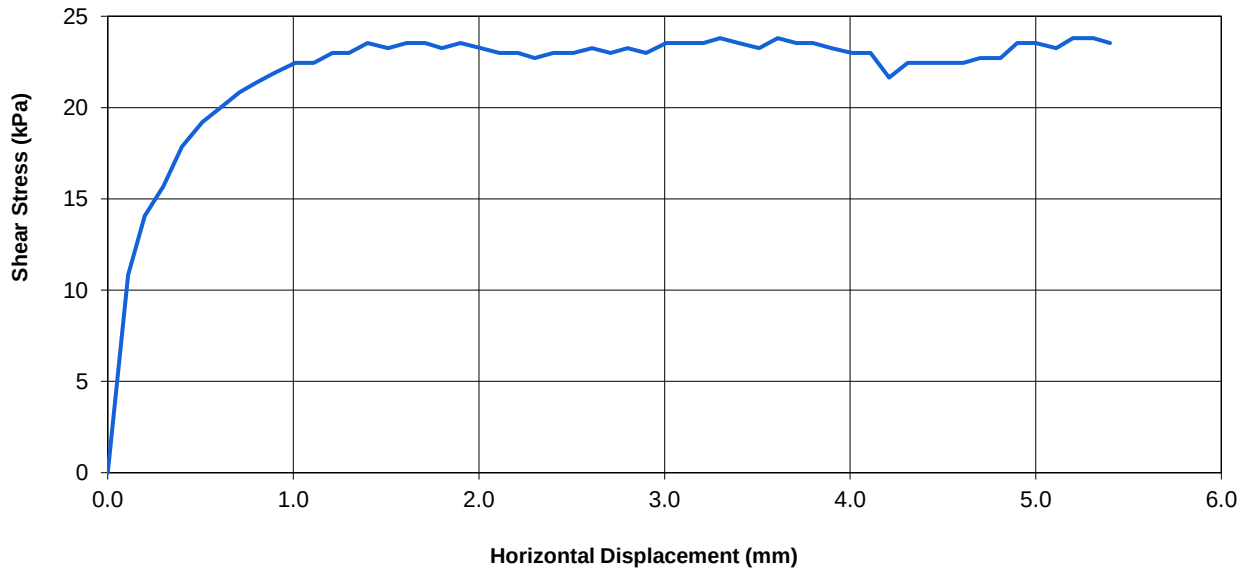
Sample Type	B

Description:

Greyish brown slightly gravelly fine to medium SAND.

Specimen: 1





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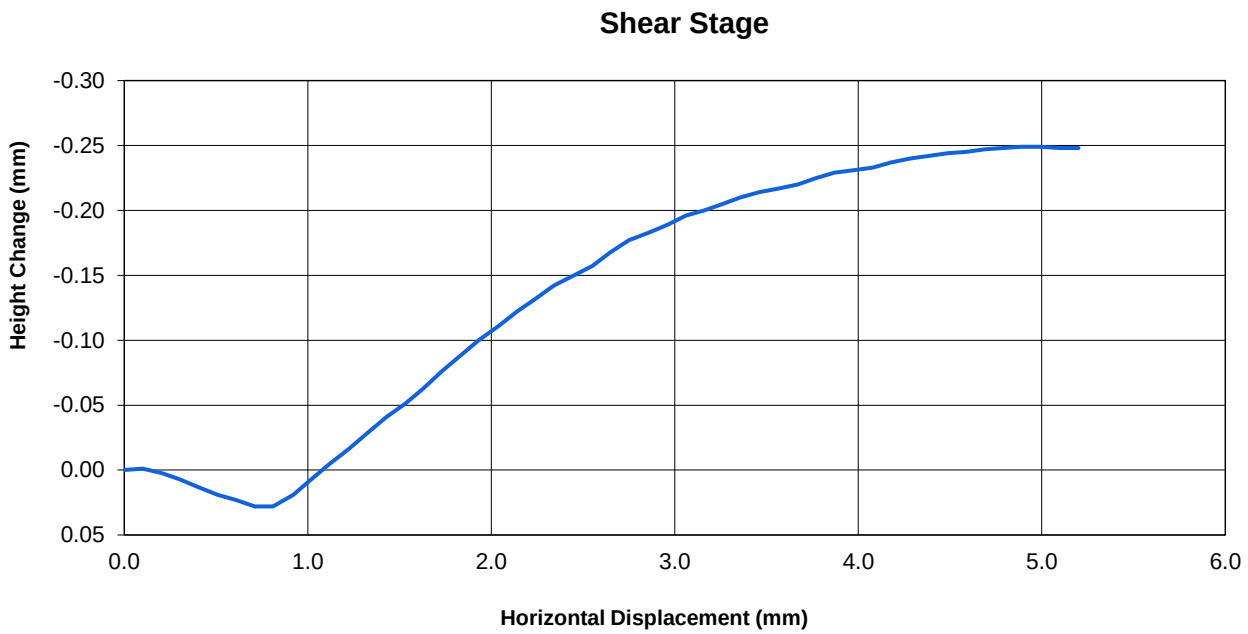
(small shearbox apparatus)

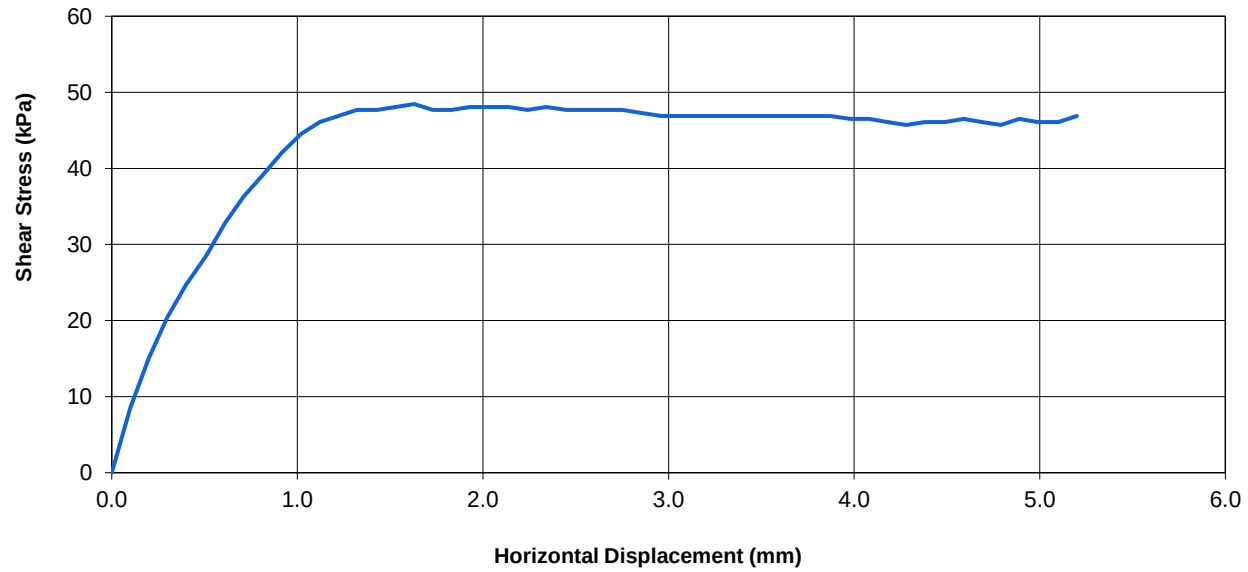
Borehole No	BHSP05
Depth (m)	8.00-8.45
Sample Type	B

Description:

Greyish brown slightly gravelly fine to medium SAND.

Specimen: 2





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DIRECT SHEAR TEST – SHEARBOX

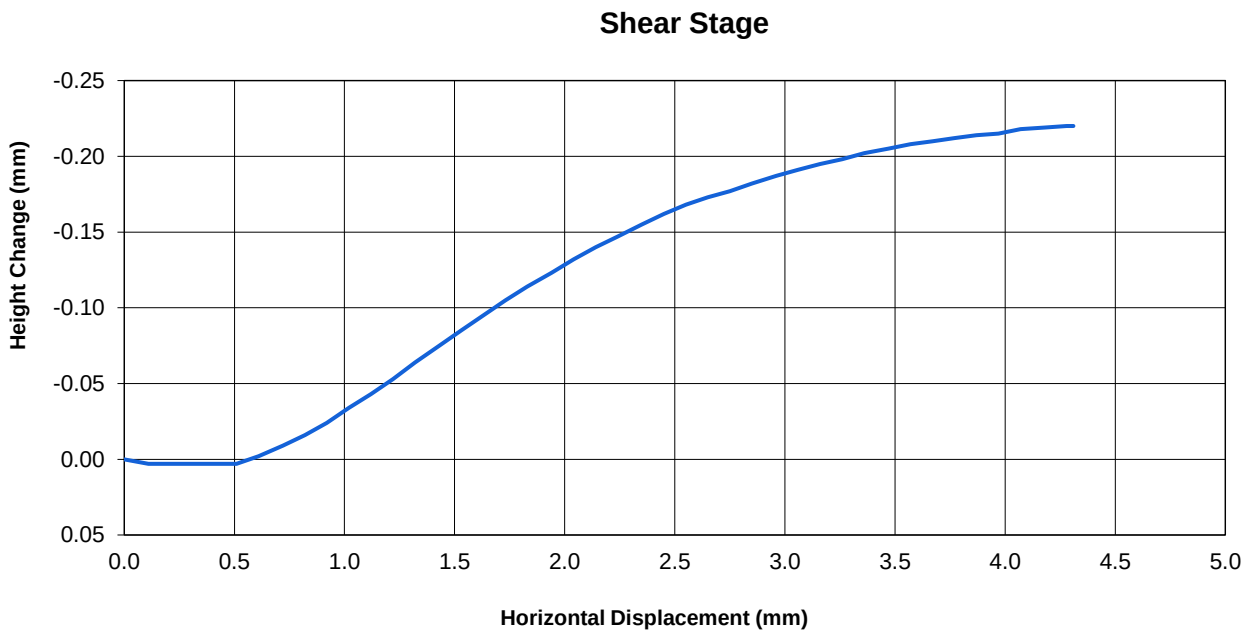
(small shearbox apparatus)

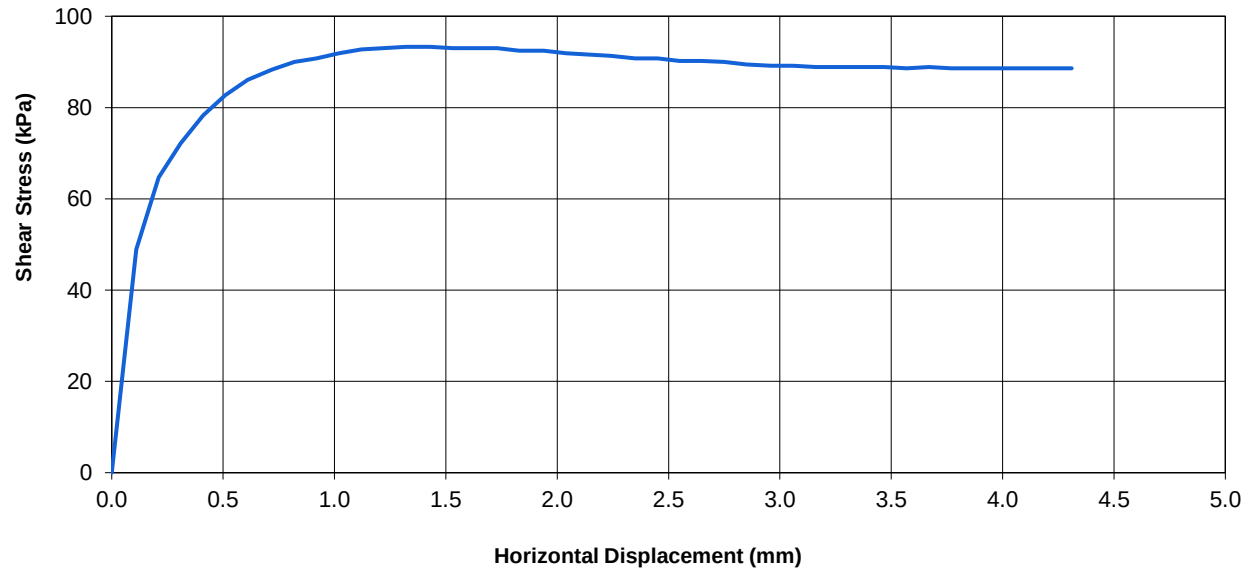
Borehole No	BHSP05
Depth (m)	8.00-8.45
Sample Type	B

Description:

Greyish brown slightly gravelly fine to medium SAND.

Specimen: 3





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DIRECT SHEAR TEST – SHEARBOX

(small shearbox apparatus)

Borehole No	BHSP05
Depth (m)	19.50-19.95
Sample Type	B

Description:

Brownish grey slightly silty fine to medium SAND.

Specimen Details

Depth within original sample	*m*	n/a
Orientation within original sample		n/a
Test condition		Submerged
Preparation		< 2 mm material remoulded at existing water content to a relative density of 50% [1]
Particle density	*Mg/m³*	2.65 (assumed)

Specimen Number		**1**	**2**	**3**
Length	*mm*	59.78	60.00	60.06
Width	*mm*	59.77	59.98	59.99
Height	*mm*	25.24	25.12	25.16
Initial water content	*%*	27.1	27.1	27.1
Initial bulk density	*Mg/m³*	1.66	1.66	1.65
Initial dry density	*Mg/m³*	1.31	1.31	1.30
Initial voids ratio		1.025	1.030	1.036
Degree of Saturation	*%*	70.1	69.7	69.4

Shearing Stage

Normal stress	*kPa*	65	130	260
Peak Conditions:				
Rate of horizontal displacement	*mm/min*	0.18	0.18	0.18
Maximum shear stress	*kPa*	42.7	91.9	174.5
Horizontal displacement at MSS	*mm*	7.8	5.0	8.0
Vertical Displacement at Peak	*mm*	0.59	0.24	0.56
Final water content	*%*	28.8	27.6	28.3
Duration	*day(s)*	1	1	1

Shear Strength Parameters

		Peak Condition
Apparent Cohesion	*kPa*	**2**
Angle of Shearing Resistance	*degrees*	**34.0**

Notes: *[1] Maximum dry density = 1.54 Mg/m³ and minimum dry desnity = 1.13 Mg/m³*

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DIRECT SHEAR TEST – SHEARBOX

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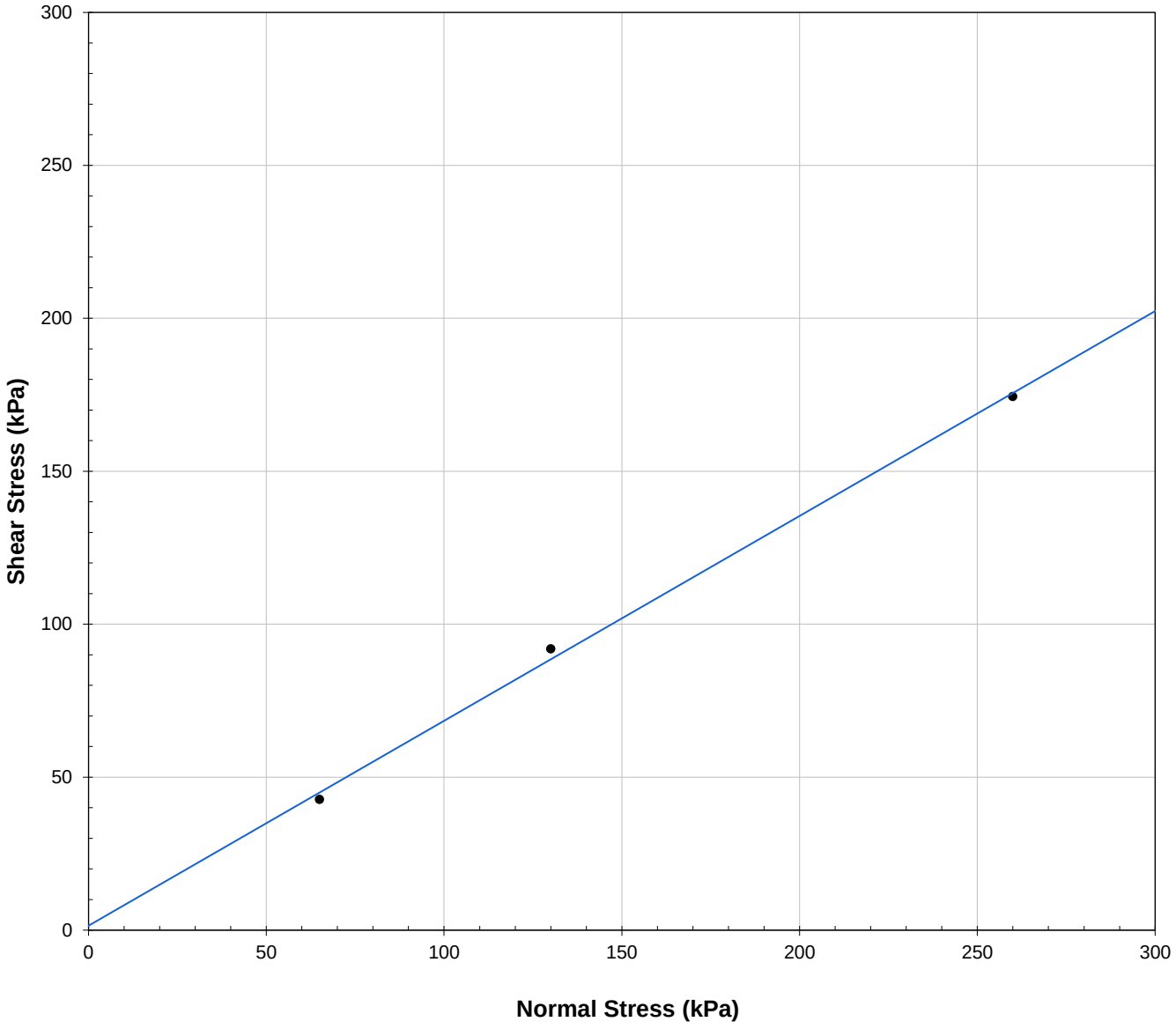
Borehole No	BHSP05
Depth (m)	19.50-19.95
Sample Type	B

Description:

Brownish grey slightly silty fine to medium SAND.

Shear Stress v Normal Stress



Peak: **c' = 2**

Φ' = 34.0

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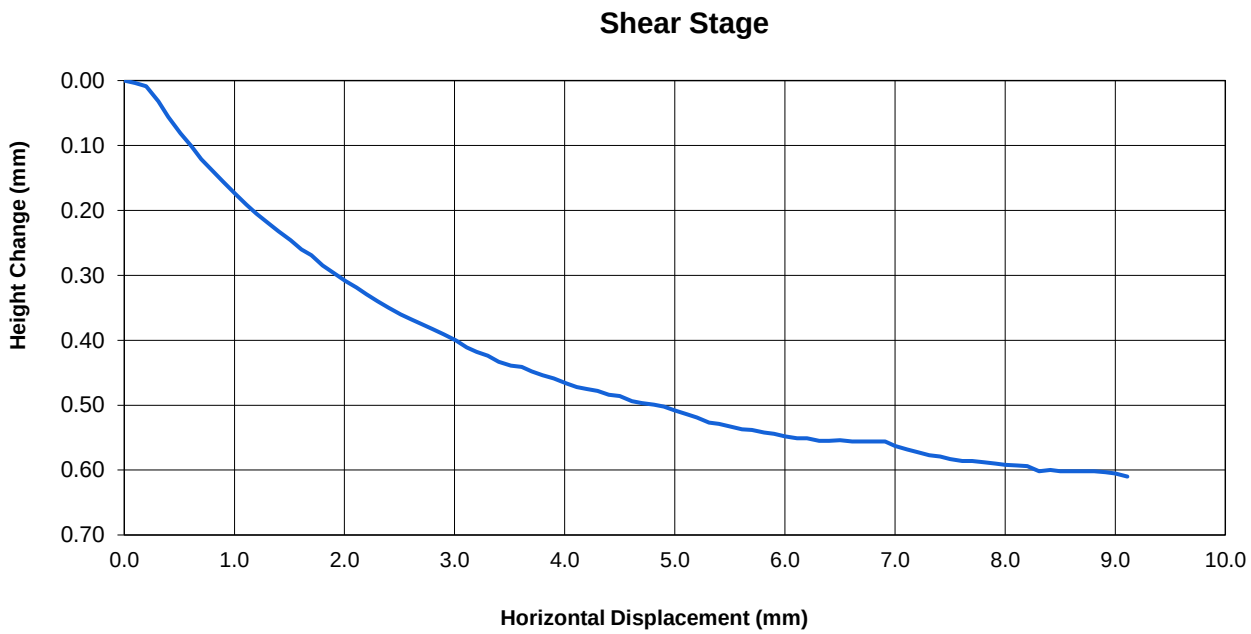
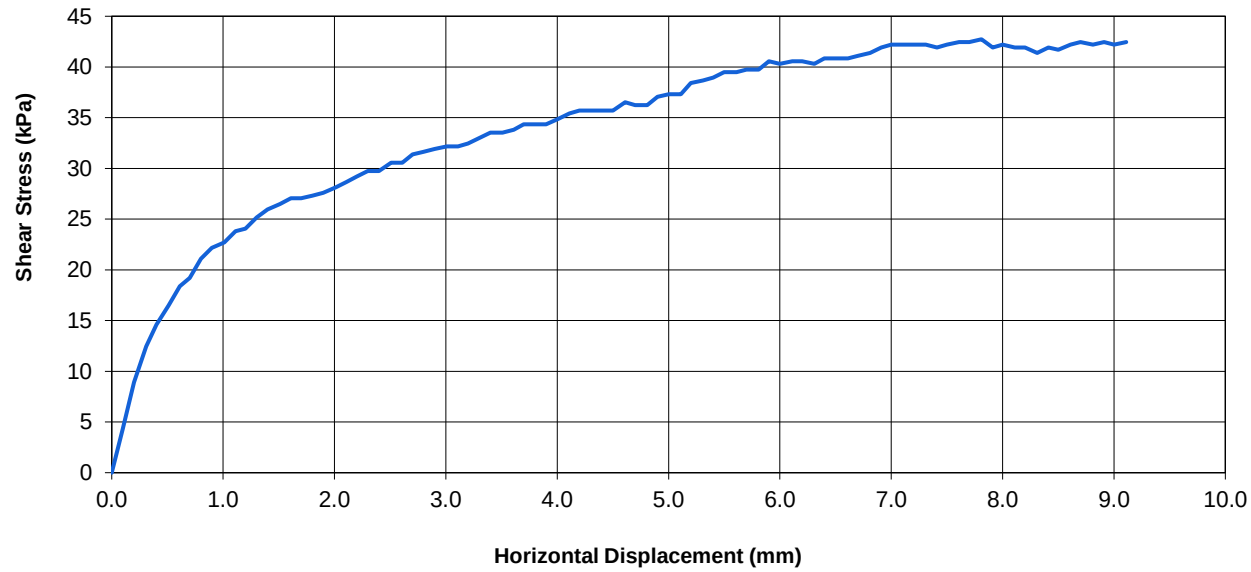
Borehole No	BHSP05
Depth (m)	19.50-19.95
Sample Type	B

Description:

Brownish grey slightly silty fine to medium SAND.

Specimen: 1





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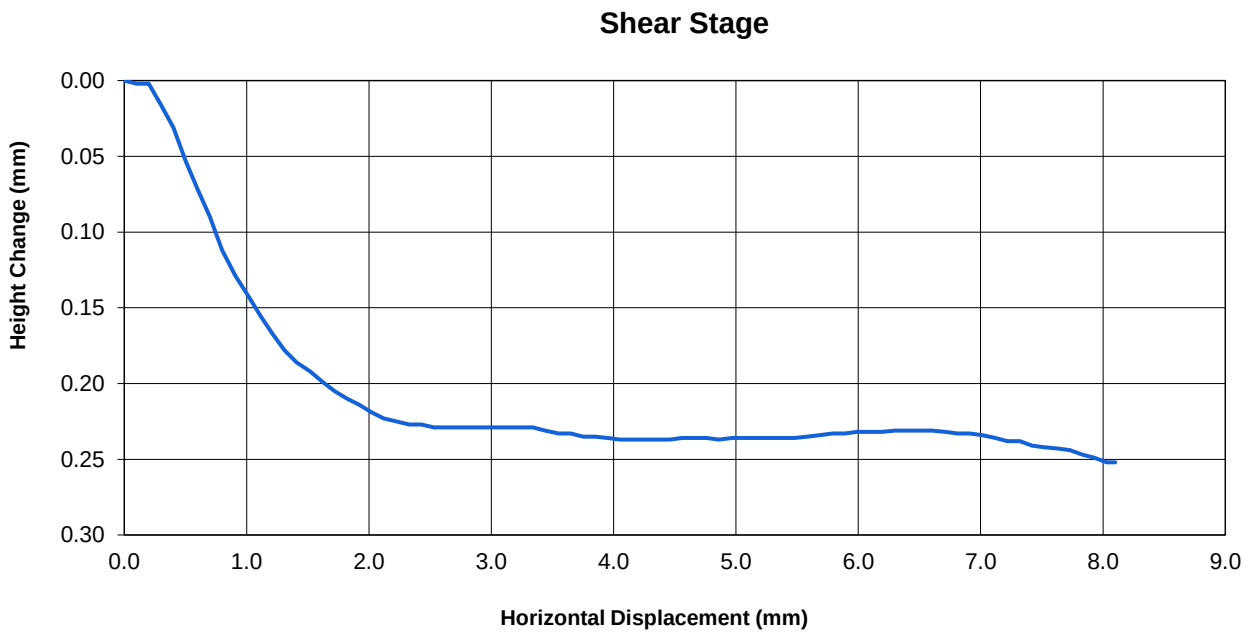
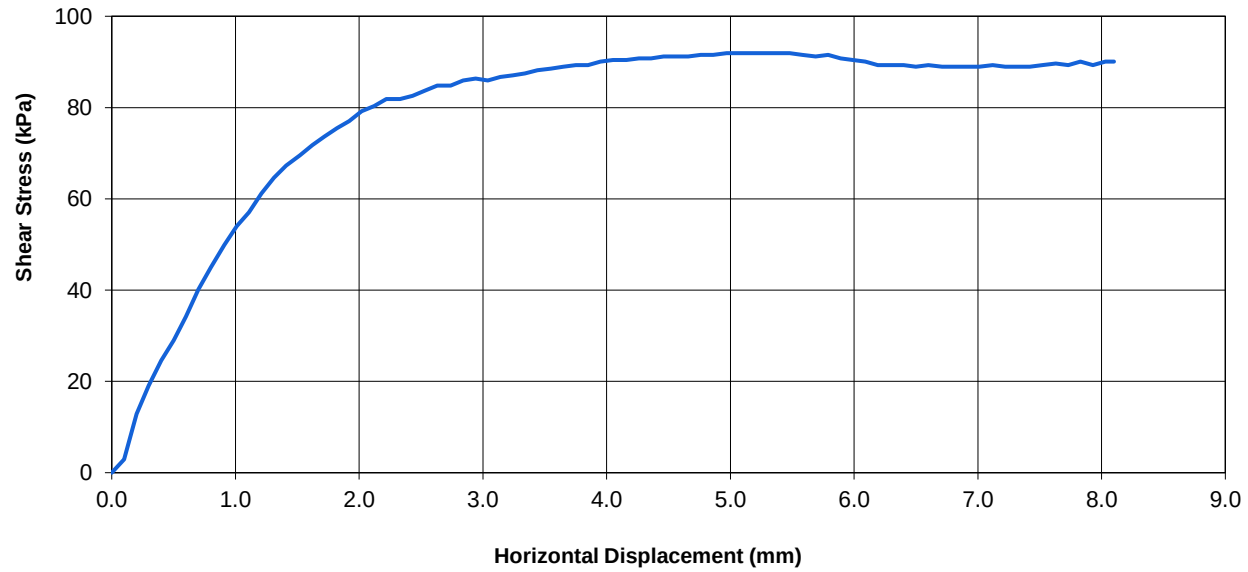
Borehole No	BHSP05
Depth (m)	19.50-19.95
Sample Type	B

Description:

Brownish grey slightly silty fine to medium SAND.

Specimen: 2





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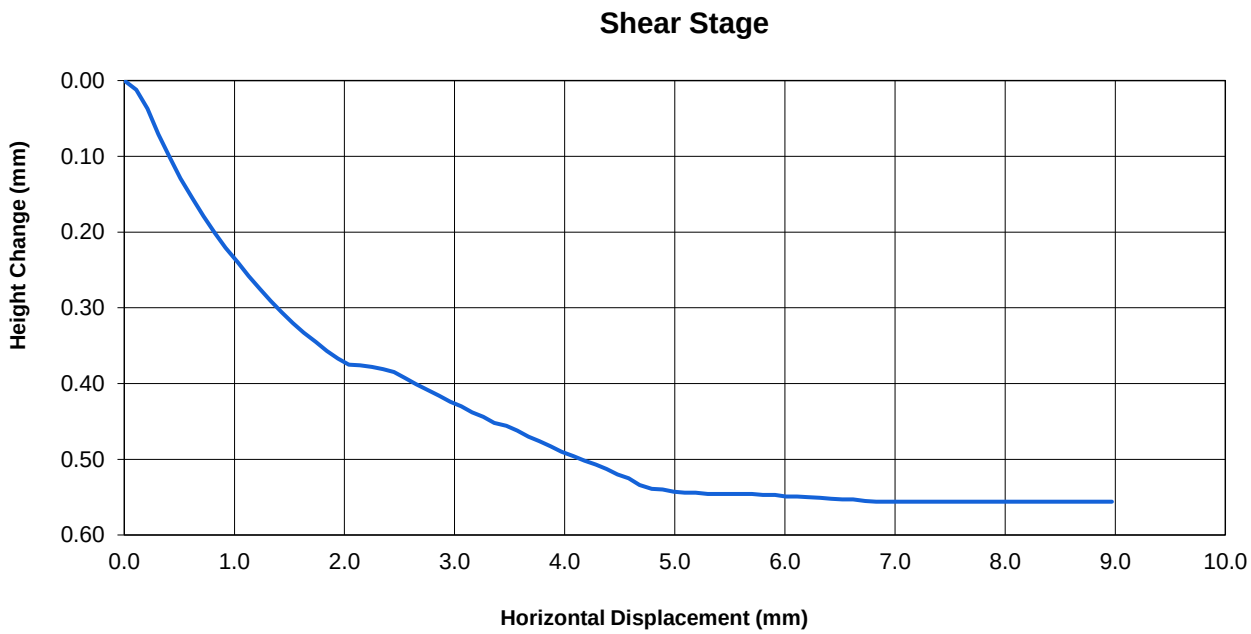
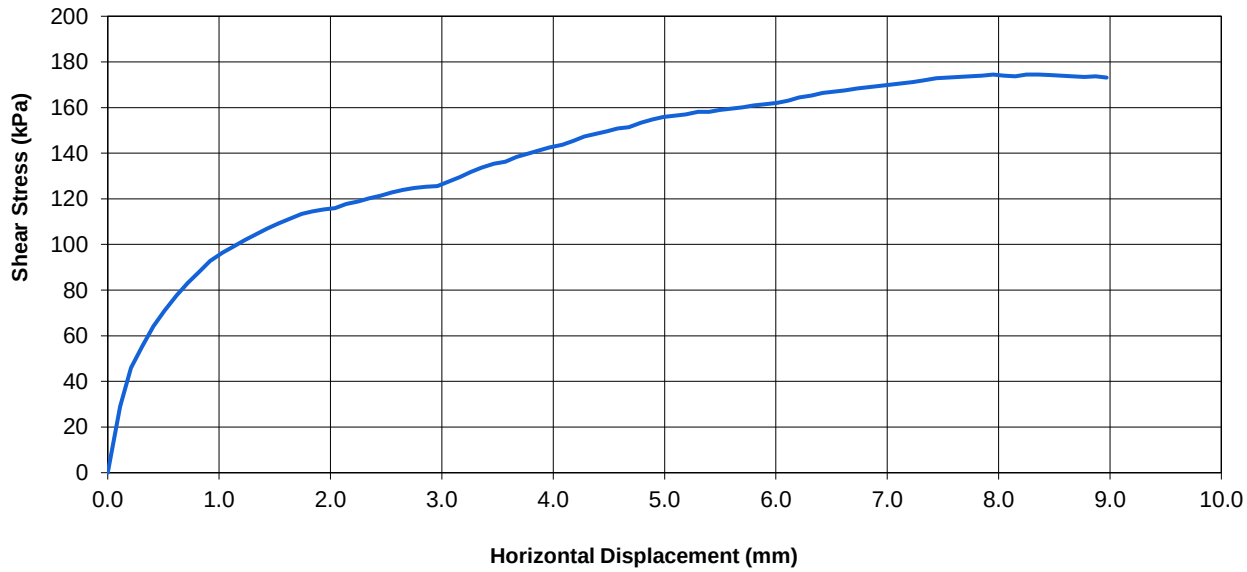
Borehole No	BHSP05
Depth (m)	19.50-19.95
Sample Type	B

Description:

Brownish grey slightly silty fine to medium SAND.

Specimen: 3





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UKAS TESTING 1982

BS1377 : Part 8 : Clause 8 : 1990 and Technical Procedure TP38

Consolidated Drained Multistage Triaxial Compression Test with Measurement of Volume Change

Borehole No.:	BHSP05
Depth (m):	10.00-10.45

Description:
Greyish brown fine to medium SAND with occasional fine to medium gravel. .

SPECIMEN DETAILS				
Depth within original sample		NA	Orientation within original sample: NA	
Remarks		Remoulded to a target 10% water content and a target dry density of 1.492 Mg/m³		
TEST DETAILS				
Specimen Type and Preparation		B (Remoulded)		
Cell Preparation		Checks performed in accordance with Clause 3.5		
Specimen Number		**Multistage**		
Initial Diameter	*mm*	70.22		
Initial Length	*mm*	139.49		
Initial Water Content	*%*	10.1		
Initial Wet Density	*Mg/m³*	1.64		
Drainage Conditions		One end only		
SATURATION STAGE		Method: Clause 5.2		
Final Cell Pressure	*kPa*	540		
Final Pore Pressure	*kPa*	535		
Final Pore Pressure Parameter B		0.97		
Duration	*day(s)*	7		
CONSOLIDATION STAGE		**Stage No 1**	**Stage No 2**	**Stage No 3**
Cell Pressure	*kPa*	540	580	660
Back Pressure	*kPa*	500	500	500
Effective Pressure	*kPa*	40	80	160
Final Pore Pressure	*kPa*	500	500	500
Final Pore Pressure Dissipation	*%*	100	100	100
Duration	*day(s)*	1	1	1
SHEARING STAGE				
Cell Pressure	*kPa*	540	580	660
Rate of Axial Displacement	*mm/min*	0.015	0.020	0.016
Initial Pore Pressure	*kPa*	500	500	500
Initial Effective Stress	*kPa*	40	80	160
CONDITIONS AT FAILURE	*criteria*	Maximum deviator stress		
Pore Pressure	*kPa*	499	500	499
Minor Effective Principal Stress	*kPa*	41	80	161
Deviator Stress	*kPa*	130	247	477
Major Effective Principal Stress	*kPa*	171	327	638
Volume Change	*mL*	-3.20	-2.90	-2.99
Volumetric Strain	*%*	-0.6	-0.5	-0.6
Axial Strain	*%*	2.5	1.7	2.2
Membrane correction applied to Deviator Stress	*kPa*	1	0	0
Duration	*day(s)*	1	1	1
Final Water Content	*%*	28.2		
Final Wet Density	*Mg/m³*	1.93		
EFFECTIVE STRESS PARAMETERS				
Cohesion	*kPa*	3.1		
Angle of Shear Resistance	*degrees*	36		
FAILURE SKETCH				

Checked and Approved by

P Heritage

P Heritage - Project Manager
16/10/2023

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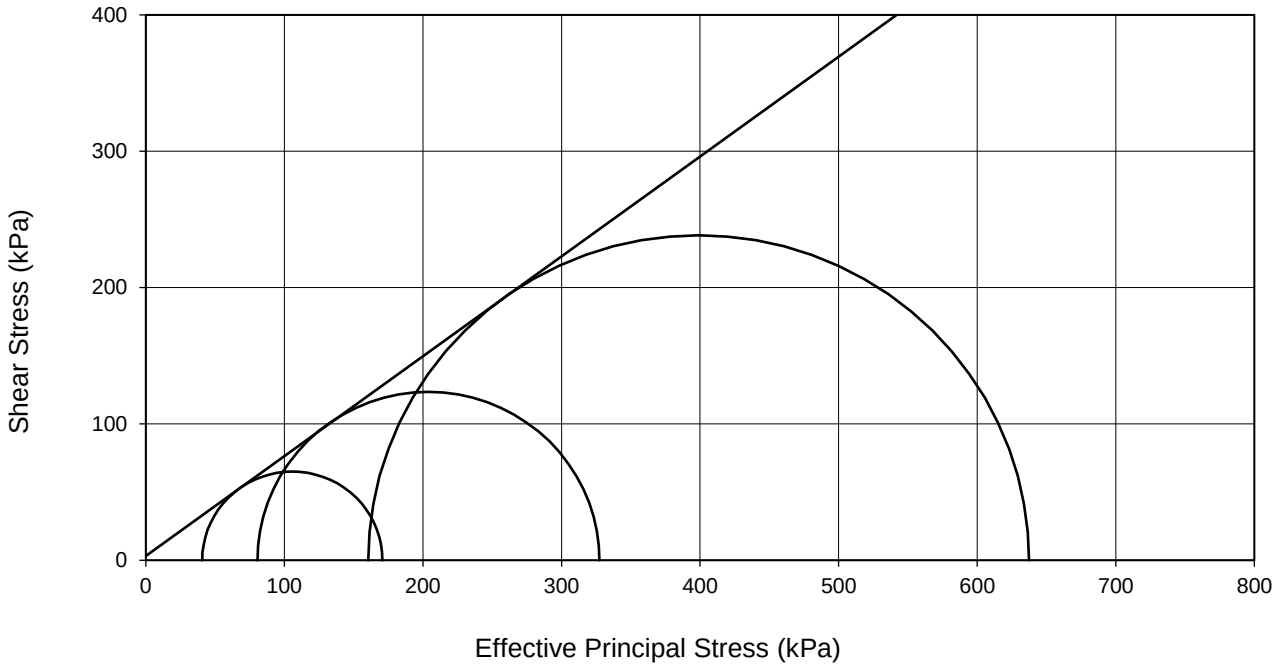

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